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Exclusion from gender counter-stereotypic activities: Proximal and distal effects

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EXCLUSION FROM GENDER COUNTER-STEREOTYPIC ACTIVITIES:
PROXIMAL AND DISTAL EFFECTS

A Dissertation

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of

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ABSTRACT

McCarty, Megan Kathleen. Ph.D., Purdue University, May 2015. Exclusion From Gender Counter-Stereotypic Activities: Proximal and Distal Effects. Major Professor: Janice R. Kelly.

The current work explored whether an incidence of exclusion is experienced differently depending on the activity from which one is excluded. Specifically, we investigated whether exclusion from gender stereotypic vs. counter-stereotypic activities affects both how threatening the experience is and beliefs about gender stereotypes. The effects of exclusion activity on need threat and beliefs about gender stereotypes were explored in a series of four studies using multiple methods: participants relived exclusion or inclusion instances from their real lives (Study 1), imagined exclusion or inclusion scenarios (Study 2), were excluded from a virtual ball toss game (Study 3), and were included or excluded using a live confederate paradigm (Study 4). We tested opposing hypotheses. Work by Crocker and Major suggests that exclusion from counter-stereotypic activities may not be particularly threatening, as one can attribute the experience to the external cause of others' prejudice. However work by Branscombe and colleagues suggests that exclusion from counter-stereotypic activities may be particularly threatening, as it serves as a reminder that one's group is devalued in society. Evidence from Studies 2 and 4 suggests that exclusion from counter-stereotypic activities, where there are pre-existing negative stereotypes about one's

group, is more threatening than exclusion from stereotypic activities. To the extent that individuals associate these particularly negative exclusion experiences with the counter-stereotypic activity, it is possible that they may decide not to further pursue this activity, contributing to gender segregation. This finding provides evidence of a novel moderator of exclusion effects, and demonstrates that not only do the source and targets of ostracism matter, but so too does the activity from which the targets of ostracism are excluded. This effect can be explained in part by individuals' increased likelihood to consider whether other members of their gender ingroup may have had similar experiences when excluded from counter-stereotypic activities. We also found that men's inclusion in counter-stereotypic activities reduces their endorsement of traditional gender stereotypes and beliefs about stereotype persistence. Although future research is necessary, these effects offer potential insights into both the perpetuation of gender segregation across activities and prejudice reduction.

INTRODUCTION

Imagine observing an engineering class when the instructor tells students to get into groups to work on a joint project. Students scramble to form groups, and a female student is left without a group to work with. How would she feel being excluded from this activity? Alternatively, imagine this same scenario occurs in an English class. Might this female students' exclusion experience depend in part on the activity she is excluded from (an engineering project vs. an English project)? The current work investigates whether the activity from which one is excluded impacts one's exclusion experience. In this first investigation of the effects of exclusion activity, we chose to focus on exclusion from activities that are consistent vs. inconsistent with gender stereotypes.

Gender Stereotypes

Gender stereotypes are beliefs or assumptions about men and women. Much of the work on gender stereotypes focuses on agency and communion, two fundamental dimensions along which people vary (Abele & Wojciszke, 2007; Cuddy, Glick, & Beninger, 2011; Fiske, Cuddy, & Glick, 2006). Agency encompasses self-focused traits such as independence, confidence, assertiveness, and competence. Communion encompasses other-focused traits such as kindness, helpfulness, gentleness, and sympathy. Men are believed and expected to be relatively more agentic, whereas

women are believed and expected to be relatively more communal (Bem, 1974; Eagly 1987; Eagly & Karau, 2002; Spence, Helmreich, & Stapp, 1975).

However, gender stereotypes contain information not only about the ways in which men and women are expected to act, but also what specific activities they are expected to engage in (Matlin, 2012; Rudman & Glick, 2008). In fact, there is some evidence suggesting that gendered associations with activities, roles, and interests are stronger than gendered associations with traits (Blair & Banaji, 1996). And indeed, gender segregation across activities and occupations remains high in a number of activities. For example, women continue to comprise a minority of those in science, technology, engineering, and mathematics (STEM) fields, earning only roughly 20-30% of the highest degrees in these fields (Snyder, Dillow, & Hoffman, 2009). On the other hand, women comprise the vast majority of nurses and primary caregivers (Cejka & Eagly, 1999).

These gender stereotypes can affect how people perceive and interact with others. For example, individuals who engage in gender counter-stereotypic behaviors (e.g., a female engineer or a male dancer) may be faced with social and economic penalties, known as backlash effects (Rudman, 1998; Rudman & Fairchild, 2004). These penalties may come in a variety of forms. Gender counter-stereotypic individuals may be disliked, less likely to be hired, or, of particular relevance to the current work, socially excluded.

Social Exclusion

Social exclusion is defined as “being kept apart from others,” or being prevented from participation in social interactions (Williams, 2007, pg. 427). Social

exclusion is a painful experience, threatening four fundamental needs: belonging, self-esteem, control, and meaningful existence, and often eliciting negative mood (Leary, Tambor, Terdal, & Downs, 1995; Williams, 2007; 2009). Much of the work on social exclusion to date has explored moderators of its negative effects, with a focus on who is being excluded and who is doing the excluding. For example, socially anxious people recover from exclusion experiences more slowly (Zadro, Boland, & Richardson, 2006), and exclusion from two outgroup members results in less need threat than exclusion from one outgroup and one ingroup member (Wittenbaum, Shulman, & Braz, 2010).

However, individuals are not only excluded by others, but they are also excluded from the activity in which others are engaged. Work to date has not focused on whether the impact of exclusion depends on the activity one is being excluded from. In this first investigation, we chose to focus on exclusion from gender stereotypic versus gender counter-stereotypic activities. Focusing on gender stereotypic and counter-stereotypic activities when exploring the effects of exclusion activity provides a rich initial test because we have strong preexisting expectations regarding these activities (Blair & Banaji, 1996), and because this exploration may provide insight into processes that perpetuate gender segregation.

The current work explores both proximal and more distal outcomes of being excluded from gender stereotypic vs. counter-stereotypic activities. The proximal outcome explored in the current work is need threat, a composite measure of threats to belonging, self-esteem, control, and meaningful existence that is commonly assessed in exclusion work (Williams 2007, 2009). The activity from which one is excluded may

also affect more distal outcomes, such as judgments about the types of people who tend to belong or excel in that activity. Thus, we also investigate whether being excluded from gender counter-stereotypic activities influences one's own gender stereotype endorsement and perceptions of gender stereotype persistence. Before stating our specific hypotheses, we review a variety of relevant literatures. We begin with a discussion of two literatures relevant to the proximal effects of exclusion activity on need threat: research suggesting that group membership can buffer the effects of negative experiences, and research suggesting that instead, group membership can intensify the effects of negative experiences. We then consider research germane to the distal effects of exclusion activity on stereotype endorsement and beliefs about stereotype persistence. A number of literatures are relevant, so for the sake of concision only a few of the particularly relevant literatures are summarized below: cognitive approaches to stereotypes, punitive ostracism, and system justification theory. Finally, we present our hypotheses and an overview of the present studies.

Group Membership Can Buffer Negative Effects

Previous work suggests that being a member of a negatively stereotyped group can serve self-protective functions. Crocker and Major (1989; Crocker & Major, 2003; Major & Crocker, 1993) draw on Kelley's (1967) discounting principle to theorize that the ability to attribute a negative event to another's prejudice, an external cause, reduces attributions to internal causes such as one's own lack of ability, thus protecting self-esteem.

A wealth of research is consistent with this reasoning. For example, in a classic study, African American participants received feedback from a White evaluator who

the participants believed was either privy or not to information about their race. After receiving negative feedback, those who thought the evaluator knew their race, and thus could have been giving prejudiced feedback, reported higher self-esteem than those who did not think the evaluator knew their race. Additionally, female subjects who received negative evaluations reported higher self-esteem when they attributed these evaluations to sexism on the part of the evaluator (Crocker, Voelkl, Testa, & Major, 1991; Dion, 1975; Dion & Earn, 1975). Although the majority of the research on the self-protective functions of stigma involve contexts in which members of negatively stereotyped groups receive explicitly negative evaluations, similar patterns may occur when the negative feedback comes in the form of exclusion. For example, when both men and women attribute rejection to sexism, they are less likely to attribute this treatment to internal causes and less likely to feel depressed (Major, Kaiser, McCoy, 2003).

However, attributions are not the only mechanism through which membership in a stigmatized group is hypothesized to protect against negative experiences. Crocker and Major (1989) suggest two additional processes through which this effect may occur. Individuals may cope with negative stereotypes about their group by psychologically disengaging from those activities on which their group is expected to perform poorly. In other words, individuals define their basis of self-worth as not contingent on activities in which their group is negatively stereotyped, and personally devalue these activities. For example, African Americans are negatively stereotyped regarding their intelligence, and African Americans are more likely than European Americans to psychologically disengage from tests of intelligence (Major, Spencer,

Schmader, Wolfe, & Crocker, 1998). Previous research demonstrating psychological disengagement from counter-stereotypic activities has focused on performance situations (Schmader & Major, 1999; Steele, 1997), however this same process may extend to responses to negative feedback in the form of exclusion.

Crocker and Major (1989) suggest the tendency to make ingroup comparisons is an additional process through which stigma can have a self-protective property. Members of stigmatized groups are often disadvantaged relative to members of non-stigmatized groups. Thus, stigmatized group members who compare their outcomes to those of non-stigmatized group members are likely to feel poorly. However, humans have a basic tendency to make ingroup comparisons that encourages stigmatized group members to instead compare their outcomes with those of other stigmatized group members. As these ingroup comparisons are likely to be more favorable, stigmatized groups members may not feel poorly despite their unjust experiences. For example, women may feel positively about their pay despite the gender pay gap because they are comparing their salary with those of other women, not men (Major, 1989).

Finally, group membership may buffer the negative effects of exclusion, because individuals may be more likely to expect exclusion from counter-stereotypic activities than from stereotype-consistent activities. Previous research (Gerber & Wheeler, 2014; Iannone, McCarty, Kelly, & Williams, 2014) suggests that anticipated exclusion is less detrimental than unanticipated exclusion.

Thus, although prior research has not explored the effects of exclusion from gender stereotypic vs. counter-stereotypic domains, previous research on the self-protective functions of group membership suggests that exclusion from a gender

counter-stereotypic activity may attenuate the need threat associated with the exclusion. Additionally, this previous research suggests that a number of processes might contribute to this buffering effect: attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations. However, the relationship between being a member of a negatively stereotyped group and negative experiences such as exclusion is complex (Crocker, 1999).

Group Membership Can Intensify Negative Effects

Although a substantial literature suggests that group membership can serve self-protective functions, a smaller body of previous research suggests that being a member of a negatively stereotyped group can instead intensify negative events. When a disadvantaged group member attributes a negative event to prejudice, this reflects an acknowledgement of the fact that their group is systematically devalued and rejected (Branscombe, Schmitt, & Harvey, 1999). This reminder of the relatively poor standing of one's group can hurt one's own self-esteem, as group memberships are a key contributor to self-esteem (Cooley, 1956; Mead, 1934; Tajfel & Turner, 1986). In other words, although attributing negative events to prejudice may appear to be an external attribution, this reasoning also reflects a negative internal attribution regarding one's group identity (Schmitt & Branscombe, 2002).

In line with this reasoning, previous research suggests that the recognition that one's group faces prejudice can be negatively associated with psychological well-being in African Americans (Branscombe et al., 1999; Cross & Strauss, 1998) and women (Kobrynowicz & Branscombe, 1997; Schmitt, Branscombe, Kobrynowicz, & Owen, 2002). In addition, Wirth and Williams (2009) obtained evidence that need threat

recovery following exclusion was slower when participants were in a gender minority than when they were in a control condition or were a non-permanent minority (i.e., when their avatar was a unique color). Although opportunities for attributions to prejudice were hypothesized to be strongest in the gender minority condition and to mediate the need threat findings, empirical support for this prediction was not obtained. However, other research has obtained direct evidence that attributing exclusion experiences to prejudice does hinder need threat recovery (Goodwin, Williams, & Carter-Sowell, 2010).

Thus, although the bulk of the literature suggests that exclusion from a counter-stereotypic activity should buffer need threat, this smaller number of studies particularly relevant to exclusion suggests that exclusion from a counter-stereotypic activity should intensify need threat. The primary process through which this effect should occur is through increased attributions to prejudice, which highlight society's negative assumptions about one's group. Given the mixed previous research, the current work tests two competing hypotheses regarding the relationship between exclusion activity and need threat. *Hypothesis 1A* predicts that exclusion from gender counter-stereotypic activities will result in less need threat than exclusion from gender stereotypic-activities. Alternatively, *Hypothesis 1B* predicts that exclusion from gender counter-stereotypic activities will result in more need threat than exclusion from gender stereotypic activities.

The current work also explores the potential mechanisms through which the stereotypic nature of the exclusion activity may influence need threat. Both research demonstrating a buffering relationship between group membership and the effects of

negative experiences and research demonstrating an intensifying relationship between group membership and the effects of negative experiences suggest that attributions to prejudice contribute to these effects. Exclusion from a gender counter-stereotypic activity allows individuals the opportunity to attribute this exclusion to prejudice. This may in turn attenuate the need threat associated with the exclusion through discounting processes, or alternatively may intensify the need threat associated with the exclusion to the extent that it reminds individuals that their groups are devalued by society. Thus, regardless of whether support is obtained for *Hypothesis 1A* or *1B*, *Hypothesis 2* predicts that attributions to prejudice will mediate the effect of exclusion activity on need threat.

Notably, research demonstrating that group membership buffers the effects of negative events suggests a number of additional potential processes. To the extent that individuals disengage from gender counter-stereotypic activities, exclusion from these activities may be less detrimental. Thus, *Hypothesis 3* predicts that psychological disengagement will mediate the effect of exclusion activity on need threat. Additionally, to the extent that exclusion from a gender counter-stereotypic activity may allow individuals the opportunity to assume other members of one's gender ingroup have had similar experiences, this more favorable social comparison process may in turn attenuate the need threat associated with the exclusion. Thus, *Hypothesis 4* predicts that ingroup comparisons will mediate the relationship between exclusion activity and need threat. Finally, if individuals anticipate greater exclusion from gender counter-stereotypic activities than from gender stereotypic activities, the detrimental effects of exclusion may be attenuated for gender counter-stereotypic activities. Thus,

Hypothesis 5 predicts that exclusion expectations will mediate the relationship between exclusion activity and need threat. In sum, *Hypotheses 3-5* are only relevant if the self-protective pattern of effects specified by *Hypothesis 1A* is obtained (see Figure 1).

However, if the intensification pattern of effects specified by *Hypothesis 1B* is obtained, psychological disengagement, ingroup comparisons, and exclusion expectations are not expected to mediate this effect (see Figure 2).

Exclusion and Stereotype Endorsement and Persistence

By extending previous work to explore the effects of the activity from which one is excluded, we can not only explore proximal negative effects of exclusion, such as need threat, but also explore more distal consequences regarding attitudes toward the activity from which one is excluded, such as beliefs about stereotypes. We assess beliefs about stereotypes in two ways. First, we explore whether exclusion experiences may impact the personal endorsement of gender stereotypes. Second, we explore whether exclusion experiences may inform beliefs about others' gender stereotypes, and thus the perceived likelihood that society's gender stereotypes will change or persist over time (Diekmann, Goodfriend, & Goodwin, 2004). Although previous research is mixed regarding whether exclusion from gender counter-stereotypic activities should increase or decrease need threat, a number of literatures suggest support for the prediction that exclusion from gender counter-stereotypic activities will increase the likelihood that individuals will endorse gender stereotypes relevant to this activity, and the likelihood that individuals will believe these gender stereotypes will persist in society.

Cognitive Approaches to Stereotyping

Cognitive approaches to stereotypes suggest that these over-generalized beliefs or expectations about how groups of people behave stem from our natural and often desirable tendency to categorize and simplify our environments (Allport, 1954; Macrae, Milne, & Bodenhausen, 1994). Thus, humans learn associations between groups of people and different traits and behaviors, and these associations are strengthened through repeated and recent exposure, a process that can be conceptualized in terms of associative network models (Gregg, Seibt, & Banaji, 2006; Higgins, 1996; Wyer & Carlston, 1994). Therefore, a recent experience where one is excluded from a gender counter-stereotypic activity is an opportunity to strengthen the link between “not me” and this activity. This experience may also strengthen the association between “not my group” and this activity, as previous work suggests that social categories can be automatically activated in the presence of a relevant stimulus (Brewer, 1988; Fiske & Neuberg, 1990), such as a gender counter-stereotypic activity.

Punitive Exclusion

Exclusion from gender counter-stereotypic activities may also increase gender stereotype endorsement and perceptions of gender stereotype persistence because exclusion can provide more direct information about who belongs in certain groups. Indeed, exclusion is theorized to be evolutionarily functional, as the act or threat of ostracism allows groups to enforce norms regarding what types of group members belong (Williams, 1997). Recent empirical work has begun to explore the circumstances under which people ostracize others, demonstrating that individuals engage in punitive ostracism, punishing people to convey the message that they do not

belong in the group for some reason (e.g., they are slower than other group members) (Wesselmann, Wirth, Pryor, Reeder, & Williams, 2013). When individuals are ostracized, they engage in reflective processes designed to make sense of the exclusion experience (Williams, 2007; 2009). During this time, individuals excluded from counter-stereotypic activities may infer that they were excluded because individuals of their gender do not belong or excel in this activity. This reflection process may increase personal endorsement of gender stereotypes, but even if it does not, it may increase perceptions that others hold these gender stereotypes, and that therefore these stereotypes are likely to persist.

System Justification

Finally, exclusion experiences from gender counter-stereotypic activities may increase gender stereotype endorsement and perceptions of gender stereotype persistence because these experiences may motivate individuals to justify the existing status quo. Both system justification theory (Jost, Banaji, & Nosek, 2004) and social dominance theory (Sidanius, Pratto, van Laar, & Levin, 2004) suggest that individuals are motivated to view their worlds as fair and good. Thus, when negative events occur, individuals may justify the status quo, often unconsciously, in an effort to retain their beliefs about the fairness of their environments. The endorsement of stereotypes is a principal way in which individuals justify the status quo, as stereotypes contribute to the legitimization of the current social hierarchies (Jost et al., 2004; Sidanius et al., 2004). Therefore, following an exclusion experience from a gender counter-stereotypic activity, individuals may increase their endorsement of gender stereotypes and beliefs

about the persistence of these stereotypes in an effort to resolve their feelings about the potential unjustness of being excluded.

In sum, by extending previous work to explore the effects of the activity from which one is excluded, we can not only explore proximal negative effects of exclusion on need threat, but also explore more distal consequences regarding attitudes toward the activity from which one is excluded. *Hypothesis 6* predicts that exclusion from gender counter-stereotypic activities will increase the likelihood that individuals will endorse gender stereotypes relevant to this activity, and the likelihood that individuals will believe these gender stereotypes will persist in society. This prediction is consistent with a number of theoretical perspectives including work on cognitive approaches to stereotypes, punitive exclusion, and system justification theory.

The Present Studies

The current work tests *Hypotheses 1-6* in a series of four studies. In Study 1, female participants wrote in detail about a real life experience during which they were included or excluded in a gender stereotypic or gender counter-stereotypic activity. Participants reported the degree to which their needs were threatened during their experience. Participants also responded to items intended to measure the proposed mechanisms through which the exclusion activity may influence need threat: attributions to prejudice, psychological disengagement, ingroup comparisons, and expectations of exclusion. Finally, participants were given measures of gender stereotype endorsement, and the degree to which they believe gender stereotypes will persist.

Study 2 extends Study 1 by using a different method and by exploring these same processes in men and women. In Study 2, both men and women were asked to imagine that they were the protagonist in a detailed story in which they were included or excluded from a gender stereotypic or counter-stereotypic activity. Afterwards, the same measures of need threat, potential mechanisms, and gender stereotypes used in Study 1 were administered. Study 2 investigates whether exclusion from a gender counter-stereotypic activity has the same effects for women and men.

Study 3 further extends Studies 1 and 2 by using a different method and by manipulating the gender of the sources of social exclusion. In Study 3, female participants were excluded by two men or two women in a virtual ball-tossing game called Cyberball (Williams & Jarvis, 2006). This game was presented as a game of mental visualization, a useful skill in masculine professions (such as engineering or piloting aircrafts) or in feminine professions (such as interior and fashion design) (Sharps, Price, Williams, 1994). The previously used measures of need threat, potential mechanisms, and gender stereotypes were assessed. Study 3 tests whether the activity from which one is excluded exerts effects above and beyond the previously demonstrated effects of the gender of the sources of social exclusion (Wirth & Williams, 2009; Wittenbaum et al., 2010).

Finally, Study 4 investigates the proximal and distal effects of the activity from which one is excluded in a more externally generalizable situation involving confederates. Female participants arrived at the lab with two male confederates for a study on learning in groups. Participants were told that they would be working on a stereotypically masculine task (an electrical engineering task) or a stereotypically

feminine task (a pediatric nursing task) in pairs, and given an opportunity to indicate a preference for who they want to work with. Next, participants received false feedback that both of the other group members had chosen to work with them (inclusion condition), or that neither of the other group members had chosen to work with them (exclusion condition). Participants then responded to the measures of need threat, potential mechanisms, and gender stereotypes implemented in Studies 1-3.

In sum, the current work consists of a series of four studies that explore the effects of exclusion from gender stereotypic vs. counter-stereotypic activities. The goals of these studies are twofold: to investigate how the activity from which one is excluded affects both need threat and more distal outcomes such as judgments about gender stereotypes. By doing so, the current work connects the social exclusion and gender literatures. The current work extends previous social exclusion work by demonstrating that not only are the effects of exclusion moderated by who is excluded and by whom, but these effects are also moderated by the activity from which one is excluded. The current work also seeks to provide evidence that social exclusion from gender counter-stereotypic activities can perpetuate gender stereotypes and contribute to gender segregation by increasing personal endorsement of gender stereotypes and perceptions of the persistence of these stereotypes. Thus, not only may a female student feel differently following exclusion from a group project in an engineering vs. English class, but she may be more likely to endorse gender stereotypes and perceive these stereotypes as intractable following the engineering exclusion experience.

STUDY 1

Study 1 provides an initial test of the ways in which exclusion activity impacts need threat and beliefs about gender stereotypes (*Hypotheses 1-6*). We expect exclusion experiences, but not inclusion experiences, to be impacted by the nature of the group activity (gender stereotypic vs. counter-stereotypic). The gender stereotypic nature of the activity is not expected to impact inclusion experiences because people generally expect to be included (Gerber & Wheeler, 2014) and because prior research demonstrates that inclusion effects are often impervious to moderation (e.g., Gonsalkorale & Williams, 2007; van Beest & Williams, 2006; Zadro, Williams, & Richardson, 2004). Study 1 examines these ideas in the context of participants' actual real life experiences.

Method

Participants & Design

One hundred and eighty-two female Introduction to Psychology undergraduate students participated in exchange for partial course credit.¹ Participants who were under the age of 18 were removed ($n = 2$). Additionally, we excluded data from the second (later) instance of a repeat IP address ($n = 1$) as recommended by Gosling and colleagues (Gosling, Vazire, Srivastava, & John, 2004). Thus, the final sample consisted of 179 participants ($M_{age} = 18.86$, $SD = 1.26$). The majority of our sample

was White (77%), with the remainder indicating that they were Hispanic (3%), Asian/Pacific Islander (11%), African American (6%), or selected other or multiple racial identities (3%). Participants were randomly assigned to one condition of a 2 (Inclusion Condition: Included vs. Excluded) X 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) between-subjects design.

Procedure

Participants were recruited for a study on “Group Interactions.” After signing a consent form, participants completed this study on a computer. Participants were asked to think and then write about an experience that fits a variety of criteria.

Recall instructions. Participants were given one of the following sets of instructions, depending on condition.

Included, gender stereotypic. “Please think about a specific time in the near past when a group of acquaintances (e.g., classmates, friends, coworkers) included you as an equal in a group activity that is stereotypically feminine, and you wanted to be included in this activity. A stereotypically feminine activity is any activity that people generally associate with women but not men. In other words, think about a time when you were able to participate in a traditionally feminine activity with a group of others and were treated as an equal. For example, perhaps you were included on a group project in a nursing class, perhaps you went to a yoga class with a group of friends, or perhaps you were included in a group discussion about something stereotypically feminine.”

Included, gender counter-stereotypic. “Please think about a specific time in the near past when a group of acquaintances (e.g., classmates, friends, coworkers) included

you as in equal in a group activity that is stereotypically masculine, and you wanted to be included in this activity. A stereotypically masculine activity is any activity that people generally associate with men but not women. In other words, think about a time when you were able to participate in a traditionally masculine activity with a group of others and were treated as an equal. For example, perhaps you were included on a group project in an engineering class, perhaps you played a game of pick up football with a group of friends, or perhaps you were included in a group discussion about something stereotypically masculine.”

Excluded, gender stereotypic. “Please think about a specific time in the near past when a group of acquaintances (e.g., classmates, friends, coworkers) excluded you from a group activity that is stereotypically feminine, and you wanted to be included in this activity. A stereotypically feminine activity is any activity that people generally associate with women but not men. In other words, think about a time when you were not able to participate in a traditionally feminine activity with a group of others. For example, perhaps you were not included in a group project in a nursing class, perhaps a group of friends went to a yoga class and did not include you, or perhaps you were excluded from a group discussion about something stereotypically feminine.”

Excluded, gender counter-stereotypic. “Please think about a specific time in the near past when a group of acquaintances (e.g., classmates, friends, coworkers) excluded you from a group activity that is stereotypically masculine. A stereotypically masculine activity is any activity that people generally associate with men but not women. In other words, think about a time when you were not able to participate in a traditionally masculine activity with a group of others. For example, perhaps you were

not included in a group project in an engineering class, perhaps a group of friends played a game of pick up football and did not include you, or perhaps you were excluded from a group discussion about something stereotypically masculine.”

All participants were asked to “think of a time that was recent and significant. Try to relive the experience exactly as it happened at the time, and then try to recall the feelings and reactions that you felt at the time the experience occurred.” To ensure that the experience participants were thinking of meet the study criteria, they were first asked to answer three questions: “In the experience you are thinking of, were you excluded from/included in a group activity?” “In the experience you are thinking of, did you want to be included in the group activity?” and “In the experience you are thinking of, was this activity stereotypically masculine/feminine?” If participants’ answers to these questions did not match the condition to which they were assigned, they were asked to think of a different situation, and were provided with the initial instructions again. Once participants thought of a situation that fit the described criteria, they were given four minutes to write about the situation in detail. The majority of participants recalled an incident that fit the study criteria on the first (89%) or second (97%) try. Analyses removing participants who took multiple attempts produce virtually identical results. Thus, the results from the complete sample are reported.

Measures. After describing a real life event that fit the study criteria, participants responded to the key dependent variables.

Need threat. Participants responded to twelve items based on Williams (2009) that assess the degree to which participants’ four fundamental needs were threatened in

the described situation. Three questions assessed each of four needs: belonging (e.g., “I felt disconnected”), self-esteem (e.g., “I felt good about myself”), control (e.g., “I felt powerful”), and meaningful existence (e.g., “I felt invisible”). All questions were assessed on a scale from 1 (not at all) to 7 (extremely). These items were averaged to form a single index of need threat, reverse-coding when necessary, with higher values indicating greater need threat ($\alpha = .97$).²

Process questions. All process questions were assessed on a scale from 1 (strongly disagree) to 7 (strongly agree). Attributions to prejudice were assessed with four items based on previous research (Goodwin et al., 2010; Major et al, 2003): “I thought the way I was treated was because of who I am,” “I thought the way I was treated was due to my gender,” “I thought the way I was treated was sexist,” and “I thought the group members were biased toward me due to my gender.” These items were averaged to form a composite measure of attributions to prejudice, with higher values indicating greater attributions to prejudice ($\alpha = .80$).

Psychological disengagement was assessed with three items adapted from previous research (Schmader & Major, 1999): “In general, I value the group activity,” “The group activity is important to me personally,” and “In general, I think the group activity is valuable.” Before these items, participants were asked to indicate the group activity they described, and their response to this question replaced the general words “group activity” in these items. For example, if a participant indicated that the group activity was “engineering,” she responded to the item “In general, I value engineering.” The three items were averaged to form a psychological disengagement composite, with higher values indicating greater psychological disengagement ($\alpha = .91$).

Ingroup comparisons were assessed with one item: “At the time, I thought about how other women may have had experiences similar to mine.”³

Exclusion expectations were assessed with two items: “At the time, I expected to be excluded from the group activity” and “At the time, I expected to be included on the group activity.” These items were averaged, reverse-coding when necessary, to form an exclusion expectations composite with higher values indicating greater expectations for exclusion ($\alpha = .80$).

Beliefs about gender stereotypes. Beliefs about stereotypes were assessed in two ways. First, participants reported their current personal beliefs about gender stereotypes using items adapted from Diekmann and colleagues (2004). Participants were presented with a variety of masculine and feminine traits (e.g., mathematical, intuitive, competitive, gentle) and asked to indicate to what extent they apply to women and men generally on a scale from 1 (not at all) to 7 (very much so). Participants also reported estimates of the percentage of men and women in a variety of masculine and feminine occupations (e.g., computer programmer, engineer, nurse, secretary). Beliefs about the persistence of gender stereotypes were assessed by having participants imagine what things may be like in 50 years, in the year 2064, and then responding to the same questions that assessed gender stereotype endorsement. These responses were standardized and averaged, reverse-coding when necessary, to form a single composite index, such that higher scores indicate greater endorsement of traditional gender roles ($\alpha = .75$).⁴

Manipulation checks. Two questions assessed the effectiveness of the inclusion condition manipulation: “In the situation I described, the group included me”

and “In the situation I described, the group excluded me.” These items were responded to on a scale from 1 (strongly disagree) to 7 (strongly agree), and averaged to form an inclusion manipulation check composite ($\alpha = .97$). Three questions assessed the effectiveness of the activity condition manipulation. The items “In the situation I described, the group activity was stereotypically feminine” and “In the situation I described, the group activity was stereotypically masculine” were responded to on a scale from 1 (strongly disagree) to 7 (strongly agree). Participants also rated the group activity from 1 (typically associated with men) to 7 (typically associated with women). These three items were averaged, reverse-coding when necessary, to form an activity manipulation check composite ($\alpha = .92$). Participants also indicated whether the people engaging in the group activity were male, female, or both male and female.

Results

Analysis Strategy

The manipulation checks, need threat, process questions, and gender stereotype beliefs index were analyzed using 2 (Inclusion Condition: Included vs. Excluded) X 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) between-subjects ANOVAs. Simple effects were analyzed with independent samples t-tests. Table 1 presents correlations among the main measures from Study 1.

Manipulation Checks

Inclusion manipulation. Only the expected inclusion condition main effect was obtained on the inclusion manipulation check, $F(1, 173) = 673.62, p < .001, \eta_p^2 = .80$.⁵ Participants were more likely to report that the group had included them in the inclusion condition ($M = 6.23, SD = 1.24$) than the exclusion condition ($M = 1.78, SD$

= 1.02). The main effect of activity condition and the interaction between inclusion and activity conditions were not significant, $ps > .60$.

Activity manipulation. Only the expected activity condition main effect was obtained on the activity manipulation check, $F(1, 173) = 538.42, p < .001, \eta_p^2 = .76$. Participants were more likely to report that the group activity was feminine in the feminine condition ($M = 5.93, SD = 1.01$) than the masculine condition ($M = 2.18, SD = 1.13$). The main effect of inclusion condition and the interaction between inclusion and activity conditions were not significant, $ps > .45$.

Other gender. Additional analyses indicated that inclusion condition was not associated with the gender of the other people engaging in the group activity, $\chi^2(2, N = 177) = 4.71, p = .10$. However, activity condition was associated with group gender, $\chi^2(2, N = 177) = 127.84, p < .001$. In the masculine activity condition the majority of participants wrote about male groups ($n = 61$), as opposed to female ($n = 3$) or mixed gender ($n = 21$) groups. In the feminine activity condition the majority of participants wrote about female groups ($n = 77$), as opposed to male ($n = 1$) or mixed gender ($n = 14$) groups.

Need Threat

The expected inclusion condition main effect was obtained, $F(1, 175) = 418.27, p < .001, \eta_p^2 = .71$. Participants reported more need threat in the exclusion condition ($M = 5.22, SD = 0.98$) than the inclusion condition ($M = 2.32, SD = 0.91$). The main effect of activity condition and the interaction between inclusion and activity conditions were not significant, $ps > .45$. Therefore, support was not obtained for *Hypothesis 1A* or *1B*. The results of exploratory analyses on each of the four fundamental needs separately

(belonging, self-esteem, meaningful existence, and control) and mood are presented in Table 2.⁶

Process Questions

Attributions to prejudice. A main effect of inclusion condition was obtained, $F(1, 175) = 34.29, p < .001, \eta_p^2 = .16$. Participants were more likely to make attributions to prejudice in the exclusion condition ($M = 3.78, SD = 1.88$) than the inclusion condition ($M = 2.69, SD = 1.31$). A main effect for activity condition also occurred, $F(1, 175) = 74.20, p < .001, \eta_p^2 = .30$. Participants were more likely to make attributions to prejudice in the masculine condition ($M = 4.03, SD = 1.74$) than the feminine condition ($M = 2.44, SD = 1.23$). These main effects were qualified by an interaction, $F(1, 175) = 54.59, p < .001, \eta_p^2 = .24$. As predicted, excluded participants were more likely to make attributions to prejudice in the masculine condition ($M = 5.26, SD = 1.19$) than in the feminine condition ($M = 2.29, SD = 1.12$), $t(88) = 12.15, p < .001$. Activity condition did not impact the likelihood that included participants made attributions to prejudice, ($M = 2.80, SD = 1.29$ and $M = 2.56, SD = 1.33$, for masculine and feminine conditions respectively), $t(87) = .81, p = .42$.

Psychological disengagement. Neither the main effect of inclusion condition nor the main effect of activity condition were significant, $ps > .13$. A significant interaction between inclusion and activity conditions was obtained, $F(1, 174) = 4.27, p = .04, \eta_p^2 = .02$. Included participants were more likely to psychologically disengage in the masculine condition ($M = 3.85, SD = 1.72$) than in the feminine condition ($M = 2.99, SD = 1.67$), $t(86) = 2.36, p = .02$. However, activity condition did not impact excluded participants' psychological disengagement, ($M = 3.37, SD = 1.45$ and $M =$

3.51, $SD = 1.56$, for masculine and feminine conditions respectively), $t(88) = .44$, $p = .66$.

Ingroup comparisons. A significant main effect of activity condition was obtained, $F(1, 174) = 5.24$, $p = .02$, $\eta_p^2 = .03$. Participants were more likely to make ingroup comparisons in the masculine condition ($M = 4.32$, $SD = 1.88$) than the feminine condition ($M = 3.64$, $SD = 2.07$). Inclusion condition did not exert a significant main effect, $p > .16$. A marginal interaction between inclusion condition and activity condition was obtained, $F(1, 174) = 2.90$, $p = .09$, $\eta_p^2 = .02$. As predicted, excluded participants were more likely to make ingroup comparisons in the masculine condition ($M = 4.78$, $SD = 1.64$) than in the feminine condition ($M = 3.60$, $SD = 1.83$), $t(88) = 3.22$, $p < .01$. Activity condition did not impact the likelihood that included participants made ingroup comparisons, ($M = 3.85$, $SD = 2.03$ and $M = 3.68$, $SD = 2.30$, for masculine and feminine conditions respectively), $t(86) = .37$, $p = .71$.

Expectations. A main effect of inclusion condition was obtained, $F(1, 174) = 10.75$, $p = .001$, $\eta_p^2 = .06$. Participants were more likely to expect exclusion in the inclusion condition ($M = 2.87$, $SD = 1.58$) than the exclusion condition ($M = 2.23$, $SD = 1.18$). A main effect for activity condition also occurred, $F(1, 174) = 16.88$, $p < .001$, $\eta_p^2 = .09$. Participants were more likely to expect exclusion in the masculine condition ($M = 2.95$, $SD = 1.53$) than the feminine condition ($M = 2.15$, $SD = 1.21$). These main effects were qualified by an interaction, $F(1, 174) = 9.20$, $p < .01$, $\eta_p^2 = .05$. Participants who recalled an incident involving a masculine activity were more likely to expect exclusion in the inclusion condition ($M = 3.57$, $SD = 1.61$) than in the exclusion condition ($M = 2.33$, $SD = 1.19$), $t(84) = 4.09$, $p < .001$. However,

participants' exclusion expectations were unaffected by inclusion condition when they recalled an incident involving a feminine activity, $t(90) = 0.19, p = .85$ ($M = 2.17, SD = 1.24$; $M = 2.12, SD = 1.18$, for the inclusion and exclusion conditions respectively).

Mediational Analyses

Although a direct effect of the interaction between inclusion and activity conditions on need threat was not obtained, mediational analyses were still performed to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to the interactive effect of inclusion condition and activity condition on need threat. This procedure is consistent with current mediation practices (e.g., Hayes, 2013). To test these ideas, we used Hayes's (2013) PROCESS macro (Model 8) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.13 \leq X \leq .02$), psychological disengagement ($-.07 \leq X \leq .16$), ingroup comparisons ($-.12 \leq X \leq .08$), and exclusion expectations ($-.24 \leq X \leq .04$) each included zero. Thus, support was not obtained for *Hypotheses 2-5*.

Gender Stereotype Endorsement and Persistence

The analysis of gender stereotype endorsement and persistence yielded no significant effects, $ps > .44$. Therefore, support was not obtained for *Hypothesis 6*.

Discussion

Study 1 provided an initial test of the ways in which exclusion activity impacts need threat and beliefs about gender stereotypes. All participants were able to provide a real world incident when they were included or excluded from masculine or feminine activities. However, need threat was not impacted differently depending on whether

participants were excluded from feminine or masculine activities, and our proposed mediators were unable to account for this relationship. In addition, inclusion and activity conditions did not affect participants' beliefs about gender stereotypes and their persistence. Thus, no support was obtained for our hypotheses.

However, Study 1 did obtain evidence that the manipulations affected some of our proposed mediators in the theoretically predicted patterns. As expected, participants were more likely to make both attributions to prejudice and ingroup comparisons when excluded from a masculine activity than when excluded from a feminine activity.

Psychological disengagement and exclusion expectations were both affected by inclusion and activity type, but in unanticipated ways. Participants who were included in masculine activities were more likely to psychologically disengage than those included in feminine activities. This effect represents what we would expect at baseline, that there is more psychological disengagement from counter-stereotypic activities. However, participants were no more likely to psychologically disengage when they were excluded from masculine activities than when they were excluded from feminine activities. Perhaps these effects are artifacts of the kind of events participants recalled. Since we do not have experimental control over the types of events participants recalled, the recalled instances of inclusion from a counter-stereotypic activity may have been less meaningful or important to participants than the recalled instances of inclusion from a stereotype-consistent activity. Or perhaps being excluded from an activity signals exclusivity and value, reducing psychological disengagement effects that would otherwise be present.

The exclusion expectation results were also unanticipated. Participants were more likely to expect exclusion when they were included than when they were excluded, but only in the masculine condition. Thus, this effect appears to represent participants' surprise at being included in counter-stereotypic activities. However, these unexpected findings may also be the result of participants experiencing difficulty answering questions regarding what they thought before the event occurred.

An important strength of Study 1 is that we tested our hypotheses using individuals' own real-world experiences of inclusion or exclusion from gender stereotypic or counter-stereotypic activities. However, in this paradigm we do not have control over specific elements of the situations that participants recalled. Strong causal inferences are not possible, and the diverse types of instances recalled may create variability in our data that obscures our effects. Thus, we tested our hypotheses using methods that allowed us greater situational control in Studies 2-4. In addition, we intended to explore the effects of group gender in Study 1, but activity condition was strongly related to group gender, preventing us from exploring the two separately. We further explore whether the effects of exclusion activity depend on group gender in Studies 2-4. Group gender is measured again in Study 2, manipulated in Study 3, and kept constant in Study 4.

STUDY 2

Study 2 extends the current work by exploring *Hypotheses 1-6* using a scenario method. This method facilitates greater experimental control than does the critical incident paradigm implemented in Study 1, allowing us to make stronger causal claims. Study 2 also explores whether the hypothesized effects hold for male and female participants alike. We anticipate that the effects of exclusion activity on need threat and gender stereotype beliefs will be similar for men and women. However, there is the possibility that these effects will be more pronounced for men than for women, as the male role is particularly restrictive (Sandnabba & Ahlberg, 1999; Wood, Desmarais, & Gugula, 2002). Thus, men may be especially likely to experience less need threat following exclusion experiences from gender counter-stereotypic activities as opposed to gender stereotypic activities. And although little previous research has found moderation of inclusion experiences, the male gender role may be so restrictive that males experience greater need threat when included on a gender counter-stereotypic activity than when included on a gender stereotypic activity.

Method

Participants & Design

Two hundred and fifty-eight Introduction to Psychology undergraduate students participated in exchange for partial course credit. Participants who were under the age

of 18 were removed ($n = 4$). Also, three participants who indicated the same response on all questions were removed ($n = 3$). This resulted in a sample consisting of 251 participants (130 women; $M_{age} = 19.38$; $SD = 1.40$). The majority of our sample was White (68%), with the remainder indicating that they were Hispanic (2%), Asian/Pacific Islander (20%), African American (4%), or selected other or multiple racial identities (6%). Participants were randomly assigned to one condition of a 2 (Inclusion Condition: Included vs. Excluded) X 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) between-subjects design.

Procedure

Participants were recruited for a study on “Group Interactions.” Participants indicated their consent and completed this study on a computer. Participants were asked to read a scenario and imagine that the described situation was occurring to them at that moment. They were instructed to “Try to imagine as clearly as you can that it is really you in the situation right now. After reading the scenario, try to believe that you actually are in the situation and then answer the following questions.”

Scenarios. Participants imagined being in one of the following scenarios, depending on condition.⁷

Included, masculine activity. “Imagine you are taking an engineering course that you need for your degree. You have been sitting in class listening to lecture when the instructor tells the class to get into groups to work on a joint project. The joint project involves working as a group to complete a worksheet focusing on electrical engineering. Students scramble into groups. You look around and make eye contact

with a few students next to you. You ask these students if you can work with them. They say yes, so the teacher has you complete the worksheet together as a group.”

Included, feminine activity. “Imagine you are taking a nursing course that you need for your degree. You have been sitting in class listening to lecture when the instructor tells the class to get into groups to work on a joint project. The joint project involves working as a group to complete a worksheet focusing pediatric nursing. Students scramble into groups. You look around and make eye contact with a few students next to you. You ask these students if you can work with them. They say yes, so the teacher has you complete the worksheet together as a group.”

Excluded, masculine activity. “Imagine you are taking an engineering course that you need for your degree. You have been sitting in class listening to lecture when the instructor tells the class to get into groups to work on a joint project. The joint project involves working as a group to complete a worksheet focusing on electrical engineering. Students scramble into groups. You look around and none of the students near you make eye contact. You ask these students if you can work with them. They say no, so the teacher has you complete the worksheet alone.”

Excluded, feminine activity. “Imagine you are taking a nursing course that you need for your degree. You have been sitting in class listening to lecture when the instructor tells the class to get into groups to work on a joint project. The joint project involves working as a group to complete a worksheet focusing on pediatric nursing. Students scramble into groups. You look around and none of the students near you make eye contact. You ask these students if you can work with them. They say no, so the teacher has you complete the worksheet alone.”

Measures. After imagining being in the described situation, participants responded to the key dependent variables.

Need threat. The same need threat items from Study 1 were assessed in Study 2. However, the stem of these items was changed from “I felt” to “I would feel.” For example, participants responded to the item “I would feel disconnected.” Again, items assessing belonging, self-esteem, control, and meaningful existence were averaged to form a need threat composite ($\alpha = .94$).

Process questions. The same process measures of attributions to prejudice ($\alpha = .78$), psychological disengagement ($\alpha = .75$), ingroup comparisons, and exclusion expectations ($\alpha = .85$) from Study 1 were used in Study 2. Again, the stem of these items were changed to include the word “would,” to reflect the fact that these items tap responses to a hypothetical situation.

Beliefs about gender stereotypes. Study 2 used the same gender stereotype endorsement and gender stereotype persistence measures from Study 1 ($\alpha = .80$).

Manipulation checks. Two questions assessed the effectiveness of the inclusion condition manipulation: “In the situation I imagined, the group included me” and “In the situation I imagined, the group excluded me.” These items were responded to on a scale from 1 (strongly disagree) to 7 (strongly agree), and averaged, reverse-coding when necessary to form an inclusion manipulation check composite ($\alpha = .95$). The effectiveness of the activity condition was assessed by having participants complete the sentence “the group activity concerned” with one of the following: engineering or nursing.

Results

Analysis Strategy

The inclusion manipulation check, need threat, process questions, and gender stereotype beliefs index were analyzed using 2 (Inclusion Condition: Included vs. Excluded) X 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) X 2 (Participant Gender: Male vs. Female) between-subjects ANOVAs. Simple effects were analyzed with independent samples t-tests. The mediational analyses were conducted following the same procedures as Study 1. Table 1 presents correlations among the main measures from Study 2.

Manipulation Checks

Inclusion manipulation. Only the expected inclusion condition main effect was obtained on the inclusion manipulation check, $F(1, 242) = 214.69, p < .001, \eta_p^2 = .47$. Participants were more likely to report that the group had included them in the inclusion condition ($M = 5.38, SD = 1.53$) than the exclusion condition ($M = 2.31, SD = 1.76$). No other effects reached significance, $ps > .10$.

Activity manipulation. Inclusion condition was not significantly associated with responses to the activity manipulation check, $X^2(1, N = 238) = 0.13, p = .72$. Activity condition was significantly associated with responses to the activity manipulation check, $X^2(1, N = 238) = 190.22, p < .001$. Thirteen participants failed the manipulation check (5%), twelve in the engineering condition, and one in the nursing condition.⁸ The participants who failed the activity manipulation check were excluded from further analysis. Thus, the primary analyses were conducted on a final sample of 238 participants.

Other gender. Additional analyses indicated that inclusion condition was not associated with the imagined gender of the other people engaging in the group activity, $X^2(2, N = 237) = 2.99, p = .23$. Participant gender was also not significantly associated with group gender, $X^2(2, N = 237) = 4.00, p = .14$. However, activity condition was associated with group gender, $X^2(2, N = 237) = 27.66, p < .001$. In the masculine activity condition the majority of participants imagined mixed gender ($n = 90$) or male groups ($n = 30$), as opposed to female groups ($n = 8$). In the feminine activity condition the majority of participants imagined mixed gender ($n = 88$) or female groups ($n = 19$), as opposed to male groups ($n = 2$).

Need Threat

The expected inclusion condition main effect was obtained, $F(1, 229) = 290.19, p < .001, \eta_p^2 = .56$. Participants reported more need threat in the exclusion condition ($M = 5.32, SD = 0.87$) than the inclusion condition ($M = 3.28, SD = 1.02$). A gender main effect was also obtained, $F(1, 229) = 14.52, p < .001, \eta_p^2 = .06$. Overall, women reported more need threat ($M = 4.53, SD = 1.36$) than men ($M = 4.07, SD = 1.39$). All other main effects and interactions, including interactions between inclusion and activity conditions, did not reach significance, $ps > .11$.

The results of exploratory analyses on each of the four fundamental needs separately (belonging, self-esteem, meaningful existence, and control) and mood are presented in Table 3. A marginal interaction between inclusion and activity conditions was obtained on meaningful existence. Excluded participants reported more threats to meaningful existence in the stereotype inconsistent condition ($M = 4.75, SD = 1.49$) than the stereotype consistent condition ($M = 4.21, SD = 1.33$), $t(115) = 2.09, p = .04$.

Activity condition did not impact included participants' threats to meaningful existence, $t(119) = 0.19, p = .85$ ($M = 2.30, SD = 1.17$; $M = 2.34, SD = 1.31$, for stereotype inconsistent and consistent conditions respectively). This finding provides some initial support for *Hypothesis 1B*.

Process Questions

Attributions to prejudice. A main effect of activity condition was obtained, $F(1, 229) = 27.10, p = .03, \eta_p^2 = .02$. Participants were more likely to make attributions to prejudice in the stereotype inconsistent condition ($M = 2.49, SD = 1.21$) than the stereotype consistent condition ($M = 2.18, SD = 1.02$). A main effect of gender was also obtained, $F(1, 229) = 8.56, p < .01, \eta_p^2 = .04$. Overall women were more likely to make attributions to prejudice ($M = 2.55, SD = 1.23$) than men ($M = 2.13, SD = 0.96$). Finally, a marginal interaction between inclusion condition and gender was obtained, $F(1, 229) = 3.00, p = .09, \eta_p^2 = .01$. In the exclusion condition, women were more likely ($M = 2.74, SD = 1.20$) than men ($M = 2.06, SD = .92$) to make attributions to prejudice, $t(114) = 3.40, p = .001$. In the inclusion condition, there was no gender difference in likelihood to make attributions to prejudice, $t(119) = 0.89, p = .38$ ($M = 2.36, SD = 1.23$; $M = 2.18, SD = 1.00$, for women and men respectively). No other effects reached significance, $ps > .31$.

Psychological disengagement. A main effect of activity condition was obtained, $F(1, 230) = 12.83, p < .001, \eta_p^2 = .05$. Participants were more psychologically disengaged in the stereotype inconsistent condition ($M = 3.53, SD = 1.32$) than in the stereotype consistent condition ($M = 2.94, SD = 1.26$). Additionally, a significant

interaction between activity condition and gender was obtained, $F(1, 230) = 9.23, p < .01, \eta_p^2 = .04$.

In the stereotype consistent condition, men were more psychologically disengaged ($M = 3.29, SD = 1.32$) than women ($M = 2.59, SD = 1.10$), $t(116) = 3.16, p < .01$. In the stereotype inconsistent condition, there was no gender difference in psychological disengagement, $t(188) = 1.31, p = .19$ ($M = 3.38, SD = 1.43$; $M = 3.70, SD = 1.23$, for men and women respectively). No other effects reached significance, $ps > .19$.

Ingroup comparisons. The analysis of ingroup comparisons yielded no significant effects, $ps > .10$.

Exclusion expectations. A main effect of inclusion condition was obtained, $F(1, 230) = 6.82, p = .01, \eta_p^2 = .03$. Participants were more likely to expect exclusion in the inclusion condition ($M = 2.78, SD = 1.44$) than the exclusion condition ($M = 2.31, SD = 1.33$). A marginal interaction between inclusion condition and gender was also obtained, $F(1, 230) = 3.29, p = .07, \eta_p^2 = .01$. The post-hoc analyses were not significant. In the inclusion condition, the trend was for women to be more likely to expect exclusion ($M = 2.95, SD = 1.55$) than men ($M = 2.61, SD = 1.29$), $t(119) = 1.30, p = .20$. In the exclusion condition, the trend was for men to be more likely to expect exclusion ($M = 2.46, SD = 1.28$) than women ($M = 2.14, SD = 1.36$), $t(115) = 1.30, p = .20$. No other effects reached significance, $ps > .16$.

Mediational Analyses

Although a direct effect of the interaction between inclusion and activity conditions on need threat was not obtained, mediational analyses were still performed

to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to the interactive effect of inclusion condition and activity condition on average need threat. This procedure is consistent with current mediation practices (e.g., Hayes, 2013). To test these ideas, we used Hayes's (2013) PROCESS macro (Model 8) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.01 \leq X \leq .15$), psychological disengagement ($-.03 \leq X \leq .08$), ingroup comparisons ($-.02 \leq X \leq .10$), and exclusion expectations ($-.07 \leq X \leq .14$) each included zero.

A marginal interaction between inclusion and activity conditions was obtained in an exploratory analysis on meaningful existence, so exploratory meditational analyses were performed to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to this effect. The confidence intervals for the indirect effects of attributions to prejudice ($-.03 \leq X \leq .31$), psychological disengagement ($-.03 \leq X \leq .12$), ingroup comparisons ($-.10 \leq X \leq .17$), and exclusion expectations ($-.13 \leq X \leq .21$) each included zero. Thus, no support was obtained for *Hypotheses 2-5*.

Gender Stereotype Endorsement and Persistence

A significant main effect of gender was obtained, $F(1, 230) = 5.07, p = .03, \eta_p^2 = .02$. Overall women were less likely to endorse traditional gender stereotypes and roles ($M = -.05, SD = .28$) than men ($M = .05, SD = .35$). Additionally, a significant interaction between activity condition, inclusion condition, and gender was obtained, $F(1, 230) = 4.43, p = .04, \eta_p^2 = .02$. The two-way interaction between inclusion and activity conditions was significant for male participants, $F(1, 108) = 4.22, p = .04, \eta_p^2 =$

.04, but not for female participants, $F(1, 122) = 0.54, p = .46$. In the inclusion condition, men were less likely to endorse traditional gender stereotypes and believe in their persistence in the stereotype inconsistent condition ($M = -.06, SD = .31$) than in the stereotype consistent condition ($M = .17, SD = .37$), $t(56) = 2.60, p = .01$. In the exclusion condition, men's endorsement of traditional gender stereotypes and beliefs about their persistence were unaffected by activity condition, $t(52) = 0.35, p = .73$ ($M = .02, SD = .29$; $M = .05, SD = .40$, for stereotype consistent and inconsistent conditions respectively). This pattern of findings does not support *Hypothesis 6*. No other effects reached significance, $ps > .19$.

Discussion

Study 2 provided a second test of the ways in which exclusion activity impacts need threat and beliefs about gender stereotypes. Although an interaction between inclusion and activity conditions was not obtained on the overall measure of need threat, exploratory analyses on the needs separately yielded effects on meaningful existence. Participants who were excluded from a counter-stereotypic activity experienced more threats to meaningful existence than participants who were excluded from a stereotypic activity. This finding suggests that the negative effects of exclusion are amplified when one is excluded from a domain in which one's group is perceived poorly, consistent with *Hypothesis 1B*. This effect was similar for both men and women, suggesting initial support for the fact that men and women are similarly affected by exclusion activity. However, this effect was not significantly mediated by attributions to prejudice, psychological disengagement, ingroup comparisons, or exclusion expectations.

The results of analyses on the proposed mediators did not yield significant interactions between inclusion and activity conditions. However, some expected effects emerged. For example, participants were more psychologically disengaged and made more attributions to prejudice in the counter-stereotypic activity condition than in the stereotypic activity condition. Additionally, in the exclusion condition only, women were more likely than men to make attributions to prejudice. An unexpected main effect of exclusion expectations emerged again, as participants were more likely to expect exclusion in the inclusion condition than the exclusion condition. Perhaps these findings reflect the surprise with which participants experienced exclusion more than their anticipation of exclusion in the inclusion condition, as suggested by the low means.

Study 2 also provides evidence that whether one is excluded or included on a stereotypic or counter-stereotypic activity impacts the more downstream consequences of endorsement of gender stereotypes and beliefs about their persistence, although not in the anticipated fashion. Men who were included in counter-stereotypic activities were less likely to endorse gender stereotypes and believe in their persistence than men who were included in stereotypic activities. Beliefs about gender stereotypes were unaffected by activity condition for men who were excluded and women, regardless of inclusion condition. Although inconsistent with our hypotheses about the influence of exclusion activity on stereotype endorsement, these provide preliminary evidence inclusion activity matters. The involvement and inclusion of men in traditionally feminine activities may have prejudice reduction effects. Women's gender stereotype

beliefs were unaffected by inclusion condition, perhaps in part because overall these beliefs were less traditional than men's.

In sum, the results of Study 2 provide initial evidence that the activity from which we are included or excluded matters, both in terms of initial threat and in terms of downstream consequences on beliefs about stereotypes. However, a clearer picture of these effects may emerge when we assess participants who are actually experiencing inclusion and exclusion experiences from gender stereotypic and counter-stereotypic activities. Thus, Studies 3 and 4 employ lab paradigms that manipulate social exclusion.

STUDY 3

Study 3 further extended Studies 1 and 2 by manipulating the gender of the sources of social exclusion. Although the sources of ostracism from a gender counter-stereotypic activity are likely to be opposite-gender others, directly manipulating source gender allowed us to test whether the activity from which one is excluded exerts effects above and beyond the previously demonstrated effects of source gender (Wirth & Williams, 2009; Wittenbaum et al., 2010).

Study 3 also used the Cyberball paradigm, which places participants in an actual exclusion experience in the lab. Putting participants in an actual exclusion state in the lab allowed us to assess both reflexive and reflective needs. Williams' (2009) Temporal Model of Ostracism suggests that the consequences of ostracism occur in a sequence of stages. The immediate negative reaction to ostracism results in reflexive need threat. Afterwards, a sense making period ensues, where one considers why the ostracism experience occurred. Although fundamental needs may still be threatened at this reflective stage, some degree of recovery has typically occurred. Generally, the reflexive need threat is impervious to moderation, but the reflective need threat is moderated by situational and personal factors (Williams, 2009). Thus, we explored the possibility that the effect of exclusion activity on need threat is specific to the reflective stage.

Method

Participants & Design

One hundred and eighty-eight female Introduction to Psychology undergraduate students participated in exchange for partial course credit. Participants who indicated they had played Cyberball previously were removed ($n = 6$), leaving a sample of 182 participants ($M_{age} = 19.41$, $SD = 1.67$). The majority of our sample was White (68%), with the remainder indicating that they were Hispanic (3%), Asian/Pacific Islander (16%), African American (3%), or selected other or multiple racial identities (10%). Participants were randomly assigned to one condition of a 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) X 2 (Ostracizer Gender: Male vs. Female) between-subjects design.

Procedure

Participants reported to the lab, and after signing a consent form, completed this study on a computer. Participants were informed that the study concerned mental visualization, a skill useful in many professions, such as engineering and piloting aircrafts (in the gender counter-stereotypic condition) or interior and fashion design (in the gender stereotypic condition) (Sharps et al., 1994). Participants were told that, “There are a variety of computer tasks related to mental visualization skills in these domains and that one such task you will do now is Cyberball. Cyberball is a virtual ball toss game that is related to mental visualization skills in engineering and piloting aircrafts / interior and fashion design.” Before playing the game, participants were asked to enter their name for the other players to see.

Cyberball game. Participants were actually playing a pre-programmed Cyberball game (Williams & Jarvis, 2006). This was a 30-throw virtual ball-toss game with two other “players” designed to manipulate exclusion. All participants were excluded, only receiving the ball twice from the other players, and then never receiving the ball again. Two male names (Brian and Matt) or two female names (Karen and Sara) appeared below the other two players’ icons to manipulate ostracizer gender and to strengthen the perception that the other players knew the participants’ name (and therefore their gender).

Measures. After playing Cyberball, participants responded to the key dependent variables.

Need threat. Consistent with previous research using Cyberball, need threat was assessed twice. Directly after the Cyberball game, participants responded to reflexive need threat items. Participants were asked to indicate how they felt during the Cyberball game, using the same items and wording from Study 1 (e.g., “I felt disconnected”). These items were averaged to form a reflexive need threat composite ($\alpha = .89$). Then, after answering the process questions, participants responded to reflective need threat items. Participants were asked to indicate how they felt currently, using the same need threat items with new present-tense wording (e.g., “I feel disconnected”). These items were averaged to form a reflective need threat composite ($\alpha = .93$).

Process questions. The same process measures of attributions to prejudice ($\alpha = .92$), psychological disengagement ($\alpha = .80$), ingroup comparisons, and exclusion expectations ($\alpha = .78$) from Study 1 were used in Study 3.

Beliefs about gender stereotypes. Study 3 used the same gender stereotype endorsement and gender stereotype persistence measures from Study 1 ($\alpha = .74$).

Manipulation checks. A single question assessed the effectiveness of the activity manipulation. Participants completed the following item “At the beginning of the study, the experimenter and instructions indicated that Cyberball concerns mental visualization skills related to” with 1 (engineering and piloting aircrafts) or 2 (interior and fashion design). A single question assessed the effectiveness of the ostracizer gender manipulation. Participants responded to the following item “The other two participants were” with 1 (both male), 2 (both female), or 3 (one male and one female).

Finally, participants were fully debriefed and re-consented to the use of their data.

Results

Analysis Strategy

The process questions and gender stereotype beliefs index were analyzed using 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) X 2 (Ostracizer Gender: Male vs. Female) between-subjects ANOVAs. The need threat composite was analyzed using a 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) X 2 (Ostracizer Gender: Male vs. Female) X 2 (Measure Type: Reflexive vs. Reflective) mixed-factor ANOVA with measure type as a within subjects variable. Simple effects were analyzed with independent samples t-tests. The mediational analyses were conducted following the same procedures as Studies 1 and 2. Table 4 presents correlations among the main measures from Study 3.

Manipulation Checks

Activity manipulation. Ostracizer gender condition was not associated with participants' responses to the activity manipulation check, $X^2(1, N = 172) = 0.39, p = .53$. Activity condition was significantly associated with participants' responses to the activity manipulation check, $X^2(1, N = 172) = 163.19, p < .001$. Two participants in the feminine activity condition failed the manipulation check and were excluded from further analysis.

Ostracizer gender manipulation. Activity condition was not associated with participants' responses to the ostracizer gender manipulation check, $X^2(1, N = 179) = 0.26, p = .88$. Ostracizer gender condition was significantly associated with participants' responses to the ostracizer gender manipulation check, $X^2(1, N = 179) = 163.67, p < .001$. In the male ostracizers condition the majority of participants indicated that both ostracizers were male ($n = 86$), one indicated both were female, and one indicated there was one male and one female. In the female ostracizers condition, the majority of participants indicated that both ostracizers were female ($n = 81$), two indicated both were male, and eight indicated there was one male and one female. Thus, twelve participants failed the manipulation check (7%) and were excluded from further analyses leaving a final sample of 168 participants.

Need Threat

A main effect of measure type was obtained on need threat, $F(1, 164) = 310.22, p < .001, \eta_p^2 = .65$. Reflexive need threat was higher ($M = 5.38, SD = .96$) than reflective need threat ($M = 3.80, SD = 1.22$), indicating some recovery. No other main effects or interactions reached significance, $ps > .18$.

The results of exploratory analyses on each of the four fundamental needs separately (belonging, self-esteem, meaningful existence, and control) and mood are presented in Table 5. A marginal three-way interaction between activity condition, ostracizer gender condition, and measure type emerged on belonging. The interaction between activity condition and ostracizer gender condition was non-significant for reflexive belonging, $F(1, 164) = 0.49, p = .49$, but significant for reflective belonging, $F(1, 164) = 5.53, p = .02, \eta_p^2 = .03$. Participants excluded from a feminine activity had marginally greater reflective threats to belonging when excluded by men ($M = 3.78, SD = 1.54$) than women ($M = 3.02, SD = 1.90$), $t(77) = 1.95, p = .06$. Ostracizer gender did not affect participants' reflective belonging threat in the masculine activity condition, $t(87) = 1.31, p = .19$, ($M = 3.10, SD = 1.41$; $M = 3.53, SD = 1.70$, for exclusion by men and women respectively). Broken down the other way, the results suggest that when participants are excluded by men, reflective belonging is more threatened in the feminine activity condition than the masculine activity condition $t(84) = 2.12, p = .04$. Activity condition does not impact participants' reflective belonging when they are excluded by women, $t(80) = 1.30, p = .20$. Additionally, a marginal main effect of activity type was observed on meaningful existence such that participants experienced more threats to meaningful existence when Cyberball was framed as feminine ($M = 4.05, SD = 1.24$) than when it was framed as masculine ($M = 3.72, SD = 1.26$). These results provide some suggestive support for *Hypothesis 1A*.

Process Questions

Attributions to prejudice. A main effect of ostracizer gender condition was obtained, $F(1, 164) = 116.63, p < .001, \eta_p^2 = .42$. Participants were more likely to make

attributions to prejudice when excluded by men ($M = 3.70$, $SD = 1.76$) than women ($M = 1.48$, $SD = 0.60$). The main effect of activity condition and interaction between ostracizer gender and activity conditions were nonsignificant, $ps > .34$.

Psychological disengagement. The analysis of psychological disengagement yielded no significant effects, $ps > .14$.

Ingroup comparisons. A main effect of ostracizer gender condition was obtained, $F(1, 164) = 13.37$, $p < .001$, $\eta_p^2 = .08$. Participants were more likely to make ingroup comparisons when excluded by men ($M = 4.07$, $SD = 1.82$) than women ($M = 3.0$, $SD = 1.85$). The main effect of activity condition and interaction between ostracizer gender and activity conditions were nonsignificant, $ps > .23$.

Exclusion expectations. The analysis of exclusion expectations yielded no significant effects, $ps > .31$.

Mediational Analyses

Although neither the direct main effect of activity condition, nor the direct effect of the interaction between activity and ostracizer gender conditions on need threat reached significance, mediational analyses were still performed to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to these effects. This procedure is consistent with current mediation practices (e.g., Hayes, 2013).

To test mediation of the direct effect, we used Hayes's (2013) PROCESS macro (Model 4) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.14 \leq X \leq .10$), psychological disengagement ($-.08 \leq X \leq .02$), ingroup comparisons ($-.02 \leq X \leq .14$), and exclusion expectations ($-.06 \leq X$

$\leq .06$) each included zero. To test mediation of the interaction, we used Hayes's (2013) PROCESS macro (Model 8) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.12 \leq X \leq .37$), psychological disengagement ($-.03 \leq X \leq .09$), ingroup comparisons ($-.22 \leq X \leq .08$), and exclusion expectations ($-.21 \leq X \leq .04$) each included zero.

As exploratory analyses yielded direct marginal effects on belonging and meaningful existence, exploratory mediational analyses were also performed to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to these. To test mediation of the direct effect of activity condition on meaningful existence, we used Hayes's (2013) PROCESS macro (Model 4) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.14 \leq X \leq .08$), psychological disengagement ($-.09 \leq X \leq .05$), ingroup comparisons ($-.02 \leq X \leq .16$), and exclusion expectations ($-.07 \leq X \leq .08$) each included zero. To test mediation of the interaction of activity condition and ostracizer gender on reflective belonging, we used Hayes's (2013) PROCESS macro (Model 8) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.14 \leq X \leq .50$), psychological disengagement ($-.05 \leq X \leq .15$), ingroup comparisons ($-.40 \leq X \leq .13$), and exclusion expectations ($-.35 \leq X \leq .06$) each included zero. Thus, no support was obtained for *Hypotheses 2-6*.

Gender Stereotype Endorsement and Persistence

The analysis of gender stereotype endorsement and persistence yielded no significant effects, $ps > .59$. Therefore, support was not obtained for *Hypothesis 6*.

Discussion

Study 3 provided a third test of the ways in which exclusion activity impacts need threat and beliefs about gender stereotypes. Although the predicted activity main effect did not emerge on the measure of overall need threat, exploratory analyses on the needs separately yielded marginal effects on belonging and meaningful existence. Participants who were excluded from a stereotypic activity experienced marginally more threats to meaningful existence than participants who were excluded from a counter-stereotypic activity. This finding suggests tentative support for *Hypothesis 1A*, whereby exclusion from counter-stereotypic activities is less consequential.

Additionally, a marginal three-way interaction between activity condition, ostracizer gender condition, and measure type emerged on belonging. The interaction between activity condition and ostracizer gender condition was significant for reflective belonging but not reflexive belonging, consistent with previous research demonstrating that reflexive reactions are difficult to moderate (Williams, 2009). Participants excluded from a feminine activity reported marginally greater threats to belonging when excluded by men than women. Ostracizer gender did not affect participants' reflective belonging threat in the masculine activity condition, although the trend was for participants to report more threat when excluded by women than men. These results suggest that, if anything, exclusion from an activity hurts more when it comes from people whose groups are stereotypically inconsistent with that activity. Thus, although the gender stereotypic nature of an activity and the gender of people engaging in this activity are likely to be strongly related, the effects of exclusion activity are unlikely a simple artifact of ostracizer gender. When this two-way

interaction between activity condition and ostracizer gender on reflective belonging is analyzed differently, we find that when participants are excluded by men, they experience more threats to reflective belonging in the gender stereotypic condition than the gender counter-stereotypic condition. Like the marginal main effect of activity condition on meaningful existence, this suggests that exclusion from counter-stereotypic activities is less consequential than exclusion from stereotypic activities, in line with *Hypothesis 1A*.

The meaningful existence and belonging effects were not significantly mediated by attributions to prejudice, psychological disengagement, ingroup comparisons, or exclusion expectations. Indeed, few significant effects were obtained on these proposed mediator variables. Only a main effect of ostracizer gender was obtained on attributions to prejudice and ingroup comparisons. Participants were more likely to report making attributions to prejudice and ingroup comparisons when the ostracizers were male as opposed to female. Although these effects were not unexpected, they were not qualified by the predicted activity condition effects. In addition, inclusion and activity conditions did not affect participants' beliefs about gender stereotypes and their persistence.

Perhaps Study 3 generally yielded few significant effects because of the subtlety of the activity manipulation in comparison to the strength of the exclusion in Cyberball. Inconsistent with Study 2, the activity condition effects that do emerge on meaningful existence and belonging support *Hypothesis 1A*. Notably, however, the belonging and meaningful existence findings from Studies 2 and 3 are marginal and only offer tentative support for *Hypotheses 1B* and *1A* respectively. Therefore, before

discussing reasons for these conflicting trends in detail we tested the effects of exclusion activity in a final study that implemented a laboratory social exclusion paradigm in which participants encountered exclusion more akin to what might be experienced in real life.

STUDY 4

Study 4 tested *Hypotheses 1-6* in a more externally generalizable situation involving confederates. In Study 4 female participants actually experienced situations in the lab similar to the scenarios used in Study 2.

Method

Participants & Design

One hundred and eighty-six female Introduction to Psychology undergraduate students participated in exchange for partial course credit. Participants who were under the age of 18 were removed ($n = 1$), resulting in a sample of 185 participants ($M_{age} = 18.88$, $SD = 1.05$). The majority of our sample was White (76%), with the remainder indicating that they were Hispanic (3%), Asian/Pacific Islander (12%), African American (2%), or selected other or multiple racial identities (7%). Participants were randomly assigned to one condition of a 2 (Inclusion Condition: Included vs. Excluded) X 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) between-subjects design.

Procedure

Participants reported to the lab with two other people (two male confederates). The experimenter consented the participants and explained the basic purpose of the study to all three “participants.” During this time, the true participant learned the

confederates' names (Matt and Cooper). Participants were told that we were interested in how people learn in virtual groups, such as those formed by online classes.

Participants were told that that they would complete a task similar to a group activity they would complete in an online class. Participants moved to individual rooms and performed the remainder of the study on the computer.

Group activity. Participants were told that in their session, they would be working on an activity for an engineering class (in the gender counter-stereotypic activity condition) or for a nursing class (in the gender stereotypic activity condition) that focused on electrical engineering or pediatric nursing. These instructions served as the manipulation of activity condition. Participants were told that this activity was designed for a group of two people, and if there were more than two people at the session, they could indicate if they have any preferences about who to work with. They were told that if the number of people at the session was not divisible by two they may end up working alone.

In the exclusion condition, participants saw the following feedback: “No one has indicated that they would like to work with you on the electrical engineering/pediatric nursing task. You will be working on the task by yourself.” In the inclusion condition, participants saw the following feedback: “Both Cooper and Matt selected to work with you on the electrical engineering/pediatric nursing task.” Thus, inclusion was manipulated by whether or not participants believed other people wanted to work with them on the group task. However, so as not to confound these inclusion beliefs with expectations that one would be completing a task alone vs. in a group, participants in the inclusion condition then saw the following feedback: “Because both

participants wanted to work with you, the computer has randomly selected pairings. You will be working on the task by yourself.” Thus, both included and excluded participants believed they would complete the upcoming task alone, but only included participants believed the other participants had wanted to work with them on the task.

Measures. Ostensibly before completing the task, participants completed measures of our key dependent variables. Study 4 used the same measures of reflexive ($\alpha = .88$) and reflective ($\alpha = .89$) need threat, attributions to prejudice ($\alpha = .85$), psychological disengagement ($\alpha = .76$), ingroup comparisons, exclusion expectations ($\alpha = .77$), and gender stereotype beliefs ($\alpha = .75$) assessed in Study 3.

Three questions assessed the effectiveness of the inclusion condition manipulation: “The other participants wanted to work with me on the group task,” “I was included on the group task” and “I was excluded from the group task.” These items were responded to on a scale from 1 (strongly disagree) to 7 (strongly agree), and averaged (reverse-coding when necessary) to form an inclusion manipulation check composite ($\alpha = .74$). The effectiveness of the activity condition was assessed by having participants complete the sentence “the group activity concerned” with one of the following: engineering, nursing, or neither of the above.

Finally, participants were fully debriefed and re-consented to the use of their data.

Results

Analysis Strategy

The inclusion manipulation check, process questions, and gender stereotype beliefs index were analyzed using 2 (Inclusion Condition: Included vs. Excluded) X 2

(Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) between-subjects ANOVAs. The need threat composite was analyzed using a 2 (Inclusion Condition: Included vs. Excluded) X 2 (Activity: Gender Stereotypic vs. Gender Counter-Stereotypic) X 2 (Measure Type: Reflexive vs. Reflective) mixed-factor ANOVA with measure type as a within subjects variable. Simple effects were analyzed with independent samples t-tests. The mediational analyses were conducted following the same procedures as Studies 1-3. Table 4 presents correlations among the main measures from Study 4.

Manipulation Checks

Inclusion manipulation. The expected inclusion condition main effect was obtained on the inclusion manipulation check, $F(1, 180) = 89.83, p < .001, \eta_p^2 = .33$. Participants were more likely to report that the group had included them in the inclusion condition ($M = 4.80, SD = 1.49$) than the exclusion condition ($M = 2.87, SD = 1.30$). Unexpectedly, the main effect of activity condition was also significant, $F(1, 180) = 5.94, p = .02, \eta_p^2 = .03$. Participants were more likely to report that the group had included them in the feminine condition ($M = 4.09, SD = 1.70$) than the masculine condition ($M = 3.59, SD = 1.66$). Because inclusion condition was manipulated independent of activity condition, perhaps this finding speaks to women's general feelings of exclusion from engineering. The interaction between inclusion and activity conditions was not significant, $p = .84$.

Activity manipulation. Unexpectedly, participants' inclusion condition was marginally associated with their responses to the activity manipulation check, $X^2(1, N = 184) = 5.20, p = .07$. This finding appears driven by the fact that more participants

selected “neither of the above” in the exclusion condition ($n = 16$) than the inclusion condition ($n = 6$). Perhaps this reflects the cognitive impairments that can be experienced with social exclusion (Baumeister, Twenge, & Nuss, 2002). Participants’ activity condition was significantly associated with their responses to the activity manipulation check, $X^2(1, N = 184) = 153.36, p < .001$. Twenty-five participants failed the manipulation check (14%), ten of these were in the engineering condition, and fifteen of these were in the nursing condition. The participants who failed the activity manipulation check were excluded from further analysis. Thus, the primary analyses were conducted on a final sample of 159 participants.

Need Threat

The expected inclusion condition main effect was obtained, $F(1, 155) = 62.12, p < .001, \eta_p^2 = .29$. Participants reported more need threat in the exclusion condition ($M = 3.86, SD = 0.93$) than the inclusion condition ($M = 2.79, SD = 0.82$). An activity condition main effect was also obtained, $F(1, 155) = 5.16, p = .03, \eta_p^2 = .03$. Participants reported more need threat in the masculine condition ($M = 3.48, SD = 1.09$) than the feminine condition ($M = 3.17, SD = 0.93$). The measure type main effect was also obtained, $F(1, 155) = 6.25, p = .01, \eta_p^2 = .04$. Participants reported more reflexive need threat ($M = 3.385, SD = 1.07$) than reflective need threat ($M = 3.26, SD = 1.08$). Thus, evidence for some recovery was obtained. All interactions, including the interaction between inclusion and activity conditions, did not reach significance, $ps > .20$.

The results of exploratory analyses on each of the four fundamental needs separately (belonging, self-esteem, meaningful existence, and control) and mood are

presented in Table 6. Significant interactions between inclusion and activity conditions were obtained on belonging and meaningful existence. Excluded participants reported more threats to belonging ($M = 3.89$, $SD = 1.23$) in the masculine condition than the feminine condition ($M = 2.87$, $SD = 1.44$), $t(74) = 3.33$, $p = .001$. Excluded participants also reported more threats to meaningful existence ($M = 3.11$, $SD = 1.29$) in the masculine condition than the feminine condition ($M = 2.29$, $SD = 1.23$), $t(74) = 2.82$, $p < .01$. Activity condition did not impact threats to belonging among included participants, $t(81) = 0.61$, $p = .54$, ($M = 1.89$, $SD = 1.01$; $M = 1.75$, $SD = .98$, for masculine and feminine conditions respectively). Activity condition also did not impact threats to meaningful existence among included participants, $t(81) = 0.69$, $p = .49$, ($M = 1.45$, $SD = .81$; $M = 1.58$, $SD = .80$, for masculine and feminine conditions respectively). These findings provide support for *Hypothesis 1B*.

Process Question

Attributions to prejudice. A main effect of inclusion condition was obtained, $F(1, 155) = 27.10$, $p < .001$, $\eta_p^2 = .15$. Participants were more likely to make attributions to prejudice in the exclusion condition ($M = 3.48$, $SD = 1.58$) than the inclusion condition ($M = 2.29$, $SD = 1.28$). The main effect of activity condition and interaction between inclusion and activity conditions were nonsignificant, $ps > .23$.

Psychological disengagement. A main effect of activity condition was obtained, $F(1, 155) = 23.25$, $p < .001$, $\eta_p^2 = .13$. Participants were more psychologically disengaged in the masculine condition ($M = 3.77$, $SD = 1.52$) than in the feminine condition ($M = 2.67$, $SD = 1.31$). The main effect of inclusion condition and interaction between inclusion and activity conditions were nonsignificant, $ps > .63$.

Ingroup comparisons. A significant main effect of inclusion condition was obtained, $F(1, 155) = 13.51, p < .001, \eta_p^2 = .08$. Participants were more likely to make ingroup comparisons in the exclusion condition ($M = 3.63, SD = 1.79$) than the inclusion condition ($M = 2.57, SD = 1.85$). Activity condition did not exert a significant main effect, $p > .74$. A marginal interaction between inclusion condition and activity condition was obtained, $F(1, 155) = 3.63, p = .06, \eta_p^2 = .02$. Although post-hoc t-tests were not significant, the general trends are consistent with predictions. Excluded participants tended to make more ingroup comparisons in the masculine condition ($M = 3.95, SD = 1.77$) than in the feminine condition ($M = 3.31, SD = 1.79$), $t(74) = 1.58, p = .12$. Activity condition did not impact the likelihood that included participants made ingroup comparisons, ($M = 2.34, SD = 1.75$ and $M = 2.79, SD = 1.95$, for masculine and feminine conditions respectively), $t(81) = 1.12, p = .27$.

Exclusion expectations. The analysis of exclusion expectations yielded no significant effects, $ps > .49$.

Mediational Analyses

Although a direct effect of the interaction between inclusion and activity conditions on need threat was not obtained, mediational analyses were still performed to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to the interactive effect of inclusion condition and activity condition on average need threat. This procedure is consistent with current mediation practices (e.g., Hayes, 2013). To test these ideas, we used Hayes's (2013) PROCESS macro (Model 8) with 5000 bootstrap samples. The confidence intervals for the indirect effects of attributions to prejudice ($-.22 \leq X \leq .06$),

psychological disengagement ($-.11 \leq X \leq .02$), ingroup comparisons ($-.29 \leq X \leq .01$), and exclusion expectations ($-.04 \leq X \leq .12$) each included zero.

As interactions between inclusion and activity conditions were obtained in exploratory analyses on belonging and meaningful existence, exploratory mediational analyses were performed to determine whether attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations contribute to these effects. For the analyses with average belonging as the dependent variable, the confidence intervals for the indirect effects of attributions to prejudice ($-.41 \leq X \leq .18$), psychological disengagement ($-.04 \leq X \leq .09$), and exclusion expectations ($-.07 \leq X \leq .25$) each included zero. However, the confidence interval for the indirect effect of ingroup comparisons did not include zero ($-.60 \leq X \leq -.02$), indicating significant mediation (see Figure 3). Likewise, for the analyses with average meaningful existence as the dependent variable, the confidence intervals for the indirect effects of attributions to prejudice ($-.33 \leq X \leq .12$), psychological disengagement ($-.14 \leq X \leq .03$), and exclusion expectations ($-.03 \leq X \leq .17$) each included zero. The confidence interval for the indirect effect of ingroup comparisons did not include zero ($-.44 \leq X \leq -.01$), indicating significant mediation (see Figure 4). Thus, although no support was obtained for *Hypotheses 2, 3, and 5*, we obtained some support for *Hypothesis 4*. Ingroup comparisons contribute to the interactive effect of inclusion and activity conditions on both belonging and meaningful existence.

Gender Stereotype Endorsement and Persistence

The analysis of gender stereotype endorsement and persistence yielded no significant effects, $ps > .14$. Therefore, support was not obtained for *Hypothesis 6*.

Discussion

Study 4 provided a final test of the ways in which exclusion activity impacts need threat and beliefs about gender stereotypes in an externally generalizable situation with confederates. Although the predicted interaction between inclusion and activity conditions did not emerge on the measure of overall need threat, exploratory analyses on the needs separately yielded significant effects. The predicted inclusion and activity condition interaction emerged on both belonging and meaningful existence. Excluded participants reported significantly more threats to belonging and meaningful existence when excluded from masculine activities than when excluded from feminine activities. These findings suggest that exclusion activity influences the experience of social exclusion. The negative effects of social exclusion were exacerbated when participants were excluded from an activity for which there were negative stereotypes about their group, consistent with *Hypothesis 1B*.

Some significant results were obtained on the analyses of proposed mediators. Participants were more likely to make attributions to prejudice when they were excluded than included, and were more psychologically disengaged from masculine activities than from feminine activities. Although these main effects are consistent with our theoretical reasoning, they were not modified by the predicted interactions between inclusion and activity conditions. A marginal interaction between inclusion and activity conditions emerged on ingroup comparisons. Consistent with predictions, participants tended to make more ingroup comparisons when excluded from masculine activities as opposed to feminine activities. In fact, although attributions to prejudice, psychological disengagement, and exclusion expectations did not mediate the observed effects on

belonging and meaningful existence, significant mediation by ingroup comparisons was obtained. Thus, ingroup comparisons are a mechanism through which exclusion from counter-stereotypic activities leads to increases in threats to belonging and meaningful existence. As in Studies 1 and 3, inclusion and activity conditions did not affect participants' beliefs about gender stereotypes and their persistence. In sum, the results of Study 4 provide evidence that the activity from which we are excluded affects how threatening it is and sheds some light on a potential mechanism through which these effects occur- ingroup comparisons.

GENERAL DISCUSSION

Individuals are not only excluded by others, but they are also excluded from the activity that these others are engaged in. Work to date has not focused on whether the impact of exclusion depends on the activity one is being excluded from. In this first investigation of the effects of the activity from which one is excluded, we chose to focus on exclusion from gender stereotypic versus gender counter-stereotypic activities. Thus, this series of four studies was designed to integrate the exclusion and gender literatures by investigating the effects of exclusion from gender stereotypic vs. counter-stereotypic activities. These studies explored two key dependent variables, one of particular relevance to the exclusion literature (need threat) and one of particular relevance to the gender literature (stereotype endorsement and beliefs about stereotype persistence).

Need Threat Effects

We obtained preliminary evidence that the activity from which one is excluded influences the aversive nature of the exclusion experience. In Study 2, those who were excluded from a counter-stereotypic activity experienced more threats to meaningful existence than those who were excluded from a stereotype-consistent activity. Likewise, in Study 4, those who were excluded from a counter-stereotypic activity experienced more threats to meaningful existence and belonging than those who were

excluded from a stereotypic activity. Thus, across two studies we found that individuals experience exclusion as more threatening when they are excluded from a counter-stereotypic activity (e.g., a woman excluded in an engineering class) as opposed to a stereotypic activity (e.g., a woman excluded in a nursing class). This effect is consistent with *Hypothesis 1B*, and the literature suggesting that reminders of society's negative expectations of one's group can be especially aversive (Branscombe et al., 1999; Tajfel & Turner, 1986). To the extent that an individual associates a particularly threatening exclusion experience with the counter-stereotypic activity, they may refrain from pursuing this activity in the future, contributing to gender segregation across activities. Evidence for the compounding negative effects of exclusion from counter-stereotypic activities were obtained using different social exclusion paradigms: a scenario paradigm and an interacting confederate paradigm.

Notably, marginal effects were obtained in Study 3 that provide suggestive support for the opposite pattern of effects. In Study 3, those who were excluded from a stereotypic activity experienced marginally more threats to meaningful existence than those who were excluded from a counter-stereotypic activity. Additionally, female participants who were excluded by men experienced more reflective threats to belonging when the activity was stereotypic than counter-stereotypic. These effects suggest that exclusion from counter-stereotypic activities may be less consequential than exclusion from stereotypic activities, consistent with *Hypothesis 1A*.

Although these effects are marginal, these trends conflict with those from Studies 2 and 4 and may provide some insight into factors that moderate the effects of exclusion activity. In particular, Cyberball is a social exclusion paradigm that was

designed in part to test exclusion effects under very minimal circumstances. Thus, Cyberball may not be as externally generalizable as other social exclusion paradigms. A benefit of Cyberball is that the exclusion or inclusion is objectively quantifiable by the number of tosses received, and readily visible to all “players.” However, this situation may create a stronger norm for inclusion than may be present in other situations (Riva, Williams, Torstrick, & Montali, 2014). In a situation with such strong inclusion norms, exclusion from a stereotype-consistent activity, where inclusion is already assumed, may be particularly detrimental, or may be perceived as especially diagnostic of some internal attribution for the exclusion. However, perhaps in other circumstances where the norm for inclusion is less strong or explicit, exclusion from counter-stereotypic activities is more detrimental, as the negative effects of exclusion are compounded with reminders of negative expectations about one’s group. Indeed, in Studies 2 and 4, the norms for inclusion may not be as strong as those in Cyberball. In Study 2, participants imagined being included or excluded on a group work activity in a class. An underlying assumption of group work is that there must be some sort of selection process, as the whole class cannot work together on the assignment. In Study 4 the norm for inclusion was even weaker, as the circumstance was specifically set up such that only two people could work on the task together; participants knew someone was going to work alone. Future research may explore the possibility that inclusion norms moderate the effects of exclusion activity by manipulating the strength of these norms.

In addition, the Cyberball study used a different manipulation of activity condition than did Studies 2 and 4: engineering and piloting aircrafts vs. electrical

engineering in the masculine condition, and interior and fashion design vs. pediatric nursing in the feminine condition. Although theoretically these different activity condition manipulations should not produce different results, these differences prevent us from concluding with certainty that exclusion paradigm differences explain our inconsistent results. Thus, future research may hold activity condition manipulations constant across studies. Future research may also use multiple examples of masculine and feminine activities within studies in order to make claims that effects generalize across different types of activities.

Although future research may explore these potential moderating factors, this initial set of studies provides stronger support for *Hypothesis 1B* than for *Hypothesis 1A*. In both Studies 2 and 4, the aversive effects of social exclusion were exacerbated when participants were excluded from an activity for which there were pre-existing negative stereotypes about their group. Thus, we provide preliminary evidence of a novel moderator of exclusion effects, demonstrating that not only do the source and targets of ostracism matter, but so too does the activity the sources of ostracism are engaging in.

Process Effects

This series of studies also explored potential processes through which exclusion activity influences need threat: attributions to prejudice, psychological disengagement, ingroup comparisons, and exclusion expectations. Attributions to prejudice generally operated in theoretically predicted fashions. For example, in Study 1, participants made more attributions to prejudice when excluded from counter-stereotypic activities than

stereotypic activities. However, attributions to prejudice did not mediate any effects of exclusion activity on fundamental needs.

In Studies 2 and 4, greater psychological disengagement was observed for counter-stereotypic activities than stereotypic activities. However, the greatest psychological disengagement was not observed for exclusion from counter-stereotypic activities, and psychological disengagement did not mediate the effects of exclusion activity on need threats.

In general, exclusion expectations yielded unexpected or null effects. In Studies 1 and 2, participants were more likely to expect exclusion in the inclusion condition. In general, participants did not report expecting exclusion, and therefore these effects may reflect the surprise participants experienced when they were excluded more than participants' anticipation of exclusion in the inclusion condition. These effects may also suggest that participants had difficulty indicating their exclusion expectations after the fact. Future studies may include measures of exclusion expectations prior to the inclusion or exclusion experience. However, careful design would be necessary to prevent these items from giving away the true purpose of the study. Perhaps embedding exclusion expectations in a series of early questions, or assessing exclusion expectations in part one of a two-part study would provide stronger evidence regarding the role of exclusion expectations in our effects.

Finally, ingroup comparisons generally operated in a theoretically predicted fashion. In Studies 1 and 4, participants made more ingroup comparisons when excluded from counter-stereotypic activities than stereotypic activities. In addition, in Study 4, ingroup comparisons significantly mediated the interaction of inclusion and

activity conditions on both meaningful existence and belonging. Thus, the fact that participants report greater ingroup comparisons when excluded from counter-stereotypic activities contributes in part to the especially threatening nature of these experiences.

Interestingly, ingroup comparisons were not predicted to mediate this pattern of findings. Only attributions to prejudice were expected to mediate exclusion activity effects regardless of whether exclusion from counter-stereotypic activities buffered or exacerbated need threat. Instead, ingroup comparisons were only predicted to mediate findings if exclusion from counter-stereotypic activities reduced need threat. This unexpected finding may be explained in part by the fact that ingroup comparisons and attributions to prejudice may tap into similar mental processes. Attributions to prejudice and ingroup comparisons were moderately to strongly correlated across our studies. Participants were generally less likely to endorse making attributions to prejudice than to report having thought about similar experiences other people from their gender ingroup may have had. Thus, perhaps participants who report making ingroup comparisons are trying to make sense of their exclusion experience and considering their gender as a potential explanation, but are unwilling to go as far as to say that their experience is due to sexism. This explanation would be consistent with previous research suggesting people can be unlikely to attribute their own negative experiences to discrimination (Taylor, Wright, Moghaddam, & Lalonde, 1990).

Gender Stereotype Belief Effects

We also expected to find that exclusion from a gender counter-stereotypic activity results in greater gender stereotype endorsement and increased beliefs about

stereotype persistence. In other words, we expected that social exclusion from gender counter-stereotypic activities would perpetuate gender stereotypes. Support for this reasoning (*Hypothesis 6*) was not obtained.

However, whether one was excluded or included on a stereotypic or counter-stereotypic activity did impact the more downstream consequences of endorsement of gender stereotypes and beliefs about their persistence in an unanticipated fashion. In Study 2, men who were included in counter-stereotypic activities were less likely to endorse gender stereotypes and believe in their persistence than men who were included in stereotypic activities. Activity condition did not affect beliefs about gender stereotypes for excluded men and women regardless of inclusion condition. Thus, although we do not obtain evidence of the role of exclusion activity in gender beliefs, we do find evidence of the role of inclusion activity in gender beliefs. Increasing men's inclusion in traditionally feminine activities may be a potential gender bias reduction strategy. Previous research suggests that prejudice can be reduced by repeatedly practicing counter-stereotypic pairings (Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000). Instead, the current study finds that a single pairing of the self with a counter-stereotypic activity through inclusion can at least temporarily reduce men's gender bias. Perhaps these findings were only obtained for male participants because as the male role is particularly restrictive (Sandnabba & Ahlberg, 1999; Wood et al., 2002), men have less experience being included in counter-stereotypic activities, making a single inclusion experience more potent. However, because male participants were only recruited in Study 2, this series of studies did not provide an opportunity to replicate these effects. Future research should further explore the potential benefits of

inclusion in counter-stereotypic activities for prejudice reduction. This future research may benefit from using more established measures of sexism such as the Ambivalent Sexism Inventory (Glick & Fiske, 1996), the Modern Sexism scale (Swim, Aikin, Hall, & Hunter, 1995), and perhaps implicit measures (e.g., Greenwald, McGhee, & Schwartz, 1998).

Additional Future Directions

The current work provides initial evidence that the activity from which we are excluded matters. However, the results are not as robust as anticipated. We obtained a number of marginal effects, and obtained effects on belonging and meaningful existence but not on overall need threat. Across the studies that manipulated exclusion (Studies 1, 2, and 4) very large main effects of this manipulation were obtained. Thus, the strength of our exclusion manipulations may have obscured the impact of the interactive effect of exclusion activity. Future research may obtain more consistent effects of exclusion activity by increasing power or by decreasing the strength of exclusion manipulations, thereby using exclusion and activity manipulations that are more comparable in strength.

Indeed, social exclusion exists on a continuum, from complete inclusion to complete exclusion. Future research may decrease the strength of the exclusion manipulation by studying partial exclusion. For example, being out of the loop, or included in an interpersonal interaction but unaware of information that is mutually known by others, is a form of partial ostracism (Jones & Kelly, 2013). In other words, in out-of-the-loop situations, one is still acknowledged and part of the group interaction, but is unable to participate fully because one is not knowledgeable about

the content of the group discussion. Thus, a critical incidents, scenario, or interacting confederate procedure could be implemented such that individuals are out of the loop on a stereotypically masculine or feminine topic of conversation. Like social exclusion, being out of the loop threatens the four fundamental needs (Jones, Carter-Cowell, Kelly, & Williams, 2009). However, there is more evidence that the aversive effects of being out of the loop can be moderated by contextual factors (e.g., Jones et al., 2009, Jones & Kelly, 2010). This previous research suggests that using partial exclusion manipulations in studies designed to detect the effects of exclusion activity may be a fruitful avenue for future research.

As previously noted, we obtained support for exclusion activity effects on need threat for belonging and meaningful existence but not for self-esteem and control. Perhaps belonging and meaningful existence are indeed more affected by exclusion activity than self-esteem and control. The effects of exclusion activity on belonging may be particularly strong because the stereotypic nature of an activity can be interpreted as a belonging cue. Thus, an activity where one's belonging is already tenuous compounded with an exclusion experience can result in stronger feelings of disconnection. It is less clear why meaningful existence has stronger theoretical links to the effects of exclusion activity than the other fundamental needs. Thus, a second possible explanation for our findings is psychometric. Higher belonging and meaningful existence scores indicate more agreement with negative statements (e.g., I feel disconnected), whereas higher self-esteem and control scores indicate more agreement with positive statements (e.g., My self-esteem is high). Thus, perhaps the effects of exclusion activity are more evident in participants' responses to negatively

worded items. Future research may benefit from supplementing the typical fundamental needs measures with negatively worded items for self-esteem and control. Negatively worded items may also be included for measures of attributions to prejudice and psychological disengagement.

Future work should also further explore whether ostracizer gender moderates exclusion activity effects. Ostracizer gender was manipulated in Study 3 in an effort to demonstrate that exclusion activity effects are not simply artifacts of ostracizer gender effects. Indeed, when one is excluded from a counter-stereotypic activity, one is more likely to be excluded by opposite gender others than by same gender others, as demonstrated in Studies 1 and 2. However, in Study 3 we found that women excluded from a feminine activity report marginally greater threats to reflective belonging when excluded by men than when excluded by women. Participants' threats to reflective belonging were unaffected by ostracizer gender in the masculine activity condition, although the trend was for participants to report more threat when excluded by women than by men. These findings suggest that if ostracizer gender effects do exist, they do not explain exclusion activity effects. Instead, if anything, exclusion from an activity is more aversive when it comes from people whose groups are stereotypically inconsistent with that activity. However, only Study 3 manipulated ostracizer gender, and this study obtained belonging and meaningful existence results that are inconsistent with Studies 2 and 4. Thus, these effects should be interpreted with caution, and future research should continue to manipulate ostracizer gender.

Additionally, future research should further explore the role of participant gender in the effects of exclusion activity on fundamental need threats. In Study 2,

exclusion from counter-stereotypic activities led to marginally greater meaningful existence threats than exclusion from stereotypic activities. This effect held for men and women equally. However, because this effect was marginal it should be interpreted with caution. Thus, future studies that include both male and female participants may allow for stronger tests of whether men and women experience exclusion from counter-stereotypic activities similarly. Again, we anticipate that effects of exclusion activity on need threat will be similar for male and female participants. However, it is possible that the restrictive nature of the male role (Sandnabba & Ahlberg, 1999; Wood et al., 2002) may reduce the negative effects of exclusion from counter-stereotypic activities for men, as their inclusion in feminine activities may be more negative experiences.

Finally, future research may explore whether individuals' prior interest in or commitment to activities influences the impact of exclusion activity. For example, perhaps female engineers are particularly sensitive to exclusion from engineering activities because of the value they place on these activities and the ties between these activities and the self-concept. Alternatively, perhaps female engineering majors have developed coping mechanisms that dampen the negative effects of exclusion from engineering activities. The relatively low number of female engineering and nursing majors in the current studies prevented us from analyzing major as a moderating factor. Future research may purposefully recruit individuals with gender stereotypic and gender counter-stereotypic majors to enable the exploration of prior interest as a moderator of exclusion activity effects. Alternatively, individuals' interest in particular activities may be assessed prior to the inclusion or exclusion experience. To avoid arousing participants' suspicion about the true purpose of the study, these items may be

part of a pre-screen, embedded in a series of filler questions, or ostensibly part of a separate study.

Implications and Conclusions

The current work consists of a series of four studies that explored the effects of exclusion from gender stereotypic vs. counter-stereotypic activities. The goals of these studies were twofold: to investigate how the activity from which one is excluded affects both need threat and more distal outcomes such as judgments about gender stereotypes. By doing so, the current work connects the social exclusion and gender literatures. The current work extends previous social exclusion work by demonstrating that not only are the effects of exclusion moderated by who is excluded and by whom, but these effects are also moderated by the activity from which one is excluded. The current work also sought to provide evidence that social exclusion from gender counter-stereotypic activities can perpetuate gender stereotypes and contribute to gender segregation by increasing personal endorsement of gender stereotypes and perceptions of the persistence of these stereotypes.

The results suggest that the negative effects of exclusion are amplified when one is excluded from a counter stereotypic activity, one for which there are already negative stereotypes about one's group. Thus, a female student may feel more negatively following exclusion from an engineering vs. a nursing classroom activity. To the extent that the student associates this particularly negative experience with engineering, she may not pursue engineering further. Thus, although there are many factors that contribute to gender segregation across activities and careers (e.g., discrimination, socialization, implicit gender stereotypes), exclusion experiences from

gender counter-stereotypic activities may also contribute to this gender segregation. The fact that exclusion hurts more when it comes from a domain where one already experiences tenuous belonging is consistent with the literature suggesting that group membership can intensify negative effects. Experiencing exclusion from counter-stereotypic activities may be particularly aversive as it serves as a reminder that one's group is devalued (Branscombe et al., 1999; Tajfel & Turner, 1986).

Exclusion from counter-stereotypic activities did not increase gender stereotyping as anticipated, but an unanticipated benefit of inclusion in counter-stereotypic activities emerged. Men who were included in feminine activities reported less endorsement of gender stereotypes and less belief in their persistence than men who were included in masculine activities. Thus, future research may explore the possibility that including men in stereotypically feminine activities may help erode pervasive gender stereotypes.

In sum, the current work provides initial evidence that the activity from which we are included or excluded matters, both in terms of initial threat and in terms of downstream consequences on beliefs about stereotypes. Exclusion from counter-stereotypic activities appears to have particularly negative effects on need threat that can be explained in part by increases in ingroup comparisons. On the other hand, men's inclusion in counter-stereotypic domains may have particularly positive effects, reducing traditional gender stereotypes and beliefs about their persistence. Thus, the activity that we are included in or excluded from can impact both the proximal aversive nature of the experience and more downstream beliefs about gender stereotypes.

Although future research is necessary, these effects offer potential insights into both the perpetuation of gender segregation across activities and prejudice reduction.

NOTES

1. Sample sizes for each of the proposed studies were calculated using G*Power. For these calculations, we used a .05 alpha error probability, .80 power, estimated a medium effect, and had 4 groups (in Studies 1, 3, and 4) or 8 groups (in Study 2).

2. Mood was assessed with nine items (e.g., “I felt positive,” “I felt sad,” and “I felt angry”) taken from prior exclusion research (Williams, 2009), twelve items (e.g., “I felt discouraged,” “I felt proud,” “I felt mad,”) taken from prior gender research (Major et al., 2003), and a single additional item, “I felt relieved.” These items were responded to on a scale from 1 (not at all) to 7 (extremely). We anticipated that the mood findings would mirror the pattern of effects obtained for need threat. However, given previous research in both the ostracism and gender literatures has obtained mixed support for mood effects (e.g., Bernstein & Claypool, 2012; Major et al., 2003), we chose to explore mood effects as opposed to make explicit a priori hypotheses regarding them.

3. A second item was also designed to measure ingroup comparisons: “At the time, I thought about how other women may not have had experiences similar to mine.” However, because across all four studies the two items were not negatively correlated with one another, we ultimately assess ingroup comparisons with the single, affirmatively-worded item.

4. For exploratory purposes, we also included measures of participants' identification with their gender group. We included the four-item identity subscale of the Collective Self-Esteem Scale (Luhtanen & Crocker, 1992), adapting the measures to apply to gender groups (e.g., "In general, being a woman is an important part of my self-image" and "Being a woman is unimportant to my sense of what kind of person I am"). We also included Tropp and Wright's (2001) measure of gender identification in which the self and the gender group are represented with two circles that vary in their degree of overlap and participants select which picture best describes their level of identification with their gender group. These measures did not moderate our obtained effects, and so are not included in our discussion of the results.

5. Degrees of freedom may vary slightly throughout the analyses, as in all four studies, participants had the option to leave items blank if they preferred.

6. Additional exploratory analyses were conducted to see if factors relevant to the described event moderated the effects. For example, including how long ago the event took place and the context (e.g., work, academic, extra-curricular) in analyses did not affect results. Only in one analysis did accounting for an additional factor impact results. Participants indicated their relationship to the group members in the described event. These responses were coded into close others (family, friends, significant other) or less close others (classmate, coworkers, acquaintance). The need threat analysis adding relationship as a dichotomous factor yielded the previously discussed inclusion condition main effect, $F(1, 171) = 264.93, p < .001, \eta_p^2 = .61$, and a significant three-way interaction emerged, $F(1, 171) = 4.45, p = .04, \eta_p^2 = .03$. The two-way interaction between inclusion and activity conditions was non-significant for those who imagined

close others, $F(1, 134) = 0.08, p = .78$, but marginal for those who imagined less close others, $F(1, 37) = 3.43, p = .07, \eta_p^2 = .09$. Although the post-hoc analyses were not significant, results indicated that among those participants who imagined less close others, more need threat was experienced when included in a masculine activity ($M = 3.07; SD = 1.49$) than a feminine activity ($M = 2.22; SD = 0.75$), $t(15) = 1.56, p = .14$. Activity type did not affect these participants' need threat in the exclusion condition, $p = .30$. These effects should be taken with great caution, as the majority of participants recalled incidences with close others (77%), so cell sizes are unequal. However, these results may suggest that the influence of inclusion condition and activity condition are strongest regarding interactions with strangers or less close others, which is the case in Studies 2-4.

7. Electrical engineering and pediatric nursing were chosen as the masculine and feminine activities respectively based on a pretest. 70 students (52 female, $M_{age} = 20.83$) from psychology courses participated in exchange for extra credit. Participants rated a variety of academic areas on a scale from 1 (typically associated with men) to 7 (typically associated with women), with 4 indicating gender neutral. Electrical engineering was rated as more masculine ($M = 1.96, SD = 1.01$) than gender neutral, $t(69) = 16.87, p < .001$, and pediatric nursing was rated as more feminine ($M = 6.31, SD = 0.80$) than gender neutral, $t(69) = -23.95, p < .001$. Although a number of other areas met these criteria, these two specific areas were chosen because of their common emphasis on science.

8. These participants were distributed across inclusion condition and gender as follows: included women ($n = 2$), excluded women ($n = 2$), included men ($n = 4$), and

excluded men ($n = 5$). As previously noted, degrees of freedom vary throughout analyses as participants were permitted to omit any answer. Thirteen participants opted not to respond to the activity manipulation check. These participants are retained in the analyses, and analyses are similar with and without them.

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APPENDICES

Table 1

Bivariate Correlations Among Variables in Studies 1 and 2

| | 1 | 2 | 3 | 4 | 5 | 6 |
|--|--------|-------|-------|-------|------|--------|
| 1. Need Threat | — | .13* | -.08 | .13 | -.01 | -.05 |
| 2. Attributions to Prejudice | .30** | — | .03 | .35** | -.02 | -.02 |
| 3. Psychological Disengagement | .04 | -.09 | — | .02 | .06 | -.10 |
| 4. Ingroup Comparisons | .09 | .34** | -.11 | — | -.03 | -.06 |
| 5. Exclusion Expectations | -.21** | -.03 | .26** | -.06 | — | -.21** |
| 6. Gender Stereotype Endorsement and Persistence | -.01 | -.04 | -.08 | .01 | -.01 | — |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Study 1 values appear on the lower diagonal, and Study 2 values appear on the upper diagonal.

Table 2

Study 1 Exploratory Results

| Dependent Variable | Inclusion Main Effect | Activity Main Effect | Interaction |
|----------------------|--------------------------------|-----------------------------|-----------------------------|
| Belonging | $F(2, 175) = 435.02, p < .001$ | $F(2, 175) = 0.01, p = .93$ | $F(2, 175) = 1.97, p = .16$ |
| Self Esteem | $F(2, 175) = 389.74, p < .001$ | $F(2, 175) = 0.10, p = .76$ | $F(2, 175) = 0.10, p = .76$ |
| Meaningful Existence | $F(2, 175) = 196.35, p < .001$ | $F(2, 175) = 0.06, p = .81$ | $F(2, 175) = 2.31, p = .13$ |
| Control | $F(2, 175) = 127.90, p < .001$ | $F(2, 175) = 0.37, p = .54$ | $F(2, 175) = 0.88, p = .35$ |
| Mood | $F(2, 175) = 496.18, p < .001$ | $F(2, 175) = 0.54, p = .46$ | $F(2, 175) = 1.36, p = .25$ |

(table continues)

| | Inclusion Condition | | Exclusion Condition | |
|----------------------|---------------------|----------|---------------------|----------|
| | Activity Condition | | | |
| | Masculine | Feminine | Masculine | Feminine |
| Belonging | 1.78 | 1.55 | 5.16 | 5.42 |
| Self Esteem | 5.60 | 5.70 | 2.47 | 2.47 |
| Meaningful Existence | 1.73 | 1.48 | 4.20 | 4.55 |
| Control | 4.47 | 4.19 | 2.27 | 2.33 |
| Mood | 2.15 | 1.92 | 4.73 | 4.78 |

Table 3

Study 2 Exploratory Results

| Effect | Belonging | Self Esteem | Meaningful Existence |
|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Inclusion Main Effect | $F(1, 230) = 348.58, p < .001$ | $F(1, 229) = 246.73, p < .001$ | $F(1, 230) = 159.49, p < .001$ |
| Activity Main Effect | $F(1, 230) = 0.00, p = .99$ | $F(1, 229) = 0.39, p = .53$ | $F(1, 230) = 1.39, p = .24$ |
| Gender Main Effect | $F(1, 230) = 8.67, p < .01$ | $F(1, 229) = 20.83, p < .001$ | $F(1, 230) = 8.12, p < .01$ |
| Inclusion X Activity | $F(1, 230) = 1.25, p = .26$ | $F(1, 229) = 0.14, p = .71$ | $F(1, 230) = 3.04, p = .08$ |
| Inclusion X Gender | $F(1, 230) = 5.95, p = .02$ | $F(1, 229) = 1.96, p = .16$ | $F(1, 230) = 0.01, p = .95$ |
| Activity X Gender | $F(1, 230) = 0.32, p = .58$ | $F(1, 229) = 0.81, p = .37$ | $F(1, 230) = 0.61, p = .44$ |
| Inclusion X Activity X Gender | $F(1, 230) = 1.12, p = .29$ | $F(1, 229) = 0.72, p = .40$ | $F(1, 230) = 0.42, p = .52$ |

(table continues)

| Effect | Control | Mood |
|-------------------------------|-------------------------------|--------------------------------|
| Inclusion Main Effect | $F(1, 230) = 41.80, p < .001$ | $F(1, 230) = 252.25, p < .001$ |
| Activity Main Effect | $F(1, 230) = 0.26, p = .61$ | $F(1, 230) = 0.25, p = .87$ |
| Gender Main Effect | $F(1, 230) = 2.78, p = .10$ | $F(1, 230) = 17.02, p < .001$ |
| Inclusion X Activity | $F(1, 230) = 1.22, p = .27$ | $F(1, 230) = 2.47, p = .12$ |
| Inclusion X Gender | $F(1, 230) = 1.11, p = .29$ | $F(1, 230) = 0.34, p = .56$ |
| Activity X Gender | $F(1, 230) = 0.66, p = .42$ | $F(1, 230) = 0.82, p = .37$ |
| Inclusion X Activity X Gender | $F(1, 230) = 0.38, p = .54$ | $F(1, 230) = 0.26, p = .61$ |

Table 4

Bivariate Correlations Among Variables in Studies 3 and 4

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|--------|-------|-------|------|-------|-------|------|
| 1. Reflexive Need Threat | — | .84** | .34** | .09 | .24** | -.03 | .07 |
| 2. Reflective Need Threat | .45** | — | .40** | .07 | .31** | -.08 | .07 |
| 3. Attributions to Prejudice | .27** | .23** | — | .12 | .62** | .00 | .16* |
| 4. Psychological Disengagement | .02 | .03 | .08 | — | -.05 | .04 | -.11 |
| 5. Ingroup Comparisons | .16* | .23** | .48** | -.07 | — | .04 | .10 |
| 6. Exclusion Expectations | -.24** | -.11 | -.06 | .07 | -.04 | — | -.04 |
| 7. Gender Stereotype Endorsement and Persistence | .25** | .06 | .06 | .04 | .03 | -.20* | — |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Study 3 values appear on the lower diagonal, and Study 4 values appear on the upper diagonal.

Table 5

Study 3 Exploratory Results

| Effect | Belonging | Self Esteem | Meaningful Existence |
|---|--------------------------------|--------------------------------|--------------------------------|
| Activity Main Effect | $F(1, 164) = 1.57, p = .21$ | $F(1, 164) = 0.00, p = .97$ | $F(1, 164) = 2.96, p = .09$ |
| Ostracizer Gender Main Effect | $F(1, 164) = 0.02, p = .89$ | $F(1, 164) = 1.14, p = .29$ | $F(1, 164) = 0.06, p = .80$ |
| Measure Type Main Effect | $F(1, 164) = 215.11, p < .001$ | $F(1, 164) = 138.16, p < .001$ | $F(1, 164) = 299.92, p < .001$ |
| Activity X Ostracizer Gender | $F(1, 164) = 3.63, p = .06$ | $F(1, 164) = 0.10, p = .75$ | $F(1, 164) = 0.46, p = .50$ |
| Measure Type X Activity | $F(1, 164) = 1.79, p = .18$ | $F(1, 164) = 3.71, p = .06$ | $F(1, 164) = 0.68, p = .41$ |
| Measure Type X Ostracizer Gender | $F(1, 164) = 1.21, p = .27$ | $F(1, 164) = 0.01, p = .91$ | $F(1, 164) = 0.73, p = .40$ |
| Measure Type X Activity X Ostracizer Gender | $F(1, 164) = 3.36, p = .07$ | $F(1, 164) = 1.03, p = .31$ | $F(1, 164) = 1.06, p = .30$ |

(table continues)

| Effect | Control | Mood |
|---|--------------------------------|--------------------------------|
| Activity Main Effect | $F(1, 164) = 0.00, p = .99$ | $F(1, 164) = 0.13, p = .72$ |
| Ostracizer Gender Main Effect | $F(1, 164) = 0.62, p = .43$ | $F(1, 164) = 0.49, p = .48$ |
| Measure Type Main Effect | $F(1, 164) = 191.85, p < .001$ | $F(1, 164) = 149.81, p < .001$ |
| Activity X Ostracizer Gender | $F(1, 164) = 0.03, p = .86$ | $F(1, 164) = 1.64, p = .20$ |
| Measure Type X Activity | $F(1, 164) = 0.04, p = .83$ | $F(1, 164) = 0.25, p = .62$ |
| Measure Type X Ostracizer Gender | $F(1, 164) = 2.60, p = .11$ | $F(1, 164) = 0.38, p = .54$ |
| Measure Type X Activity X Ostracizer Gender | $F(1, 164) = 0.12, p = .73$ | $F(1, 164) = 0.40, p = .53$ |

Table 6

Study 4 Exploratory Results

| Effect | Belonging | Self Esteem | Meaningful Existence |
|-------------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Inclusion Main Effect | $F(1, 155) = 70.39, p < .001$ | $F(1, 155) = 36.59, p < .001$ | $F(1, 155) = 50.47, p < .001$ |
| Activity Main Effect | $F(1, 155) = 9.63, p < .01$ | $F(1, 155) = 1.70, p = .19$ | $F(1, 155) = 4.34, p = .04$ |
| Measure Type Main Effect | $F(1, 155) = 2.38, p = .13$ | $F(1, 155) = 9.89, p < .01$ | $F(1, 155) = 3.45, p = .07$ |
| Inclusion X Activity | $F(1, 155) = 5.68, p = .02$ | $F(1, 155) = 0.01, p = .94$ | $F(1, 155) = 7.93, p < .01$ |
| Measure Type X Inclusion | $F(1, 155) = 3.87, p = .05$ | $F(1, 155) = 0.51, p = .48$ | $F(1, 155) = 1.41, p = .24$ |
| Measure Type X Activity | $F(1, 155) = 0.09, p = .77$ | $F(1, 155) = 0.09, p = .76$ | $F(1, 155) = 0.00, p = .99$ |
| Measure Type X Inclusion X Activity | $F(1, 155) = 0.28, p = .60$ | $F(1, 155) = 0.20, p = .66$ | $F(1, 155) = 0.07, p = .80$ |

(table continues)

| Effect | Control | Mood |
|-------------------------------------|-----------------------------|-------------------------------|
| Inclusion Main Effect | $F(1, 155) = 5.69, p = .02$ | $F(1, 155) = 39.25, p < .001$ |
| Activity Main Effect | $F(1, 155) = 0.17, p = .68$ | $F(1, 155) = 9.53, p < .01$ |
| Measure Type Main Effect | $F(1, 155) = 0.03, p = .87$ | $F(1, 155) = 25.46, p < .001$ |
| Inclusion X Activity | $F(1, 155) = 1.11, p = .29$ | $F(1, 155) = 0.79, p = .38$ |
| Measure Type X Inclusion | $F(1, 155) = 0.01, p = .92$ | $F(1, 155) = 0.19, p = .66$ |
| Measure Type X Activity | $F(1, 155) = 0.51, p = .47$ | $F(1, 155) = 0.12, p = .73$ |
| Measure Type X Inclusion X Activity | $F(1, 155) = 0.16, p = .70$ | $F(1, 155) = 0.26, p = .61$ |

Appendix B

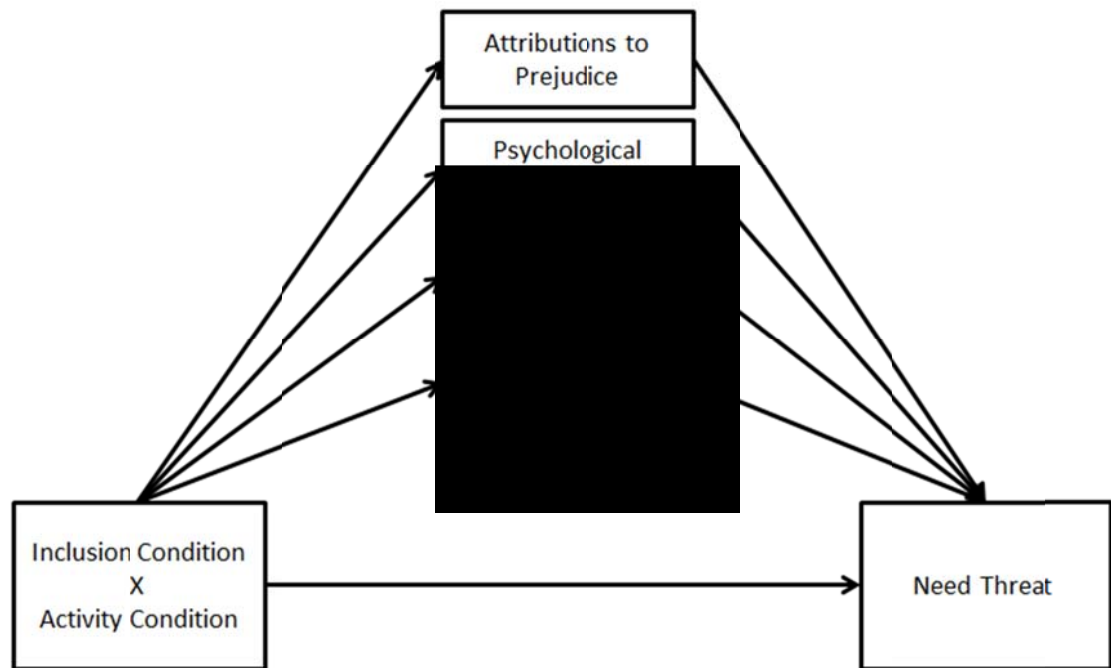


Figure 1. Mechanisms hypothesized to explain the self-protective relationship between exclusion activity and need threat (*Hypothesis 1A*).

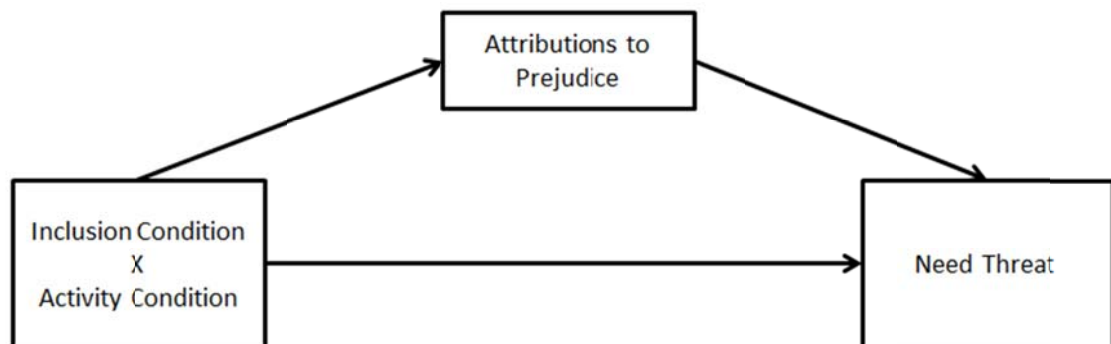


Figure 2. Mechanism hypothesized to explain the intensifying relationship between exclusion activity and need threat (*Hypothesis 1B*).

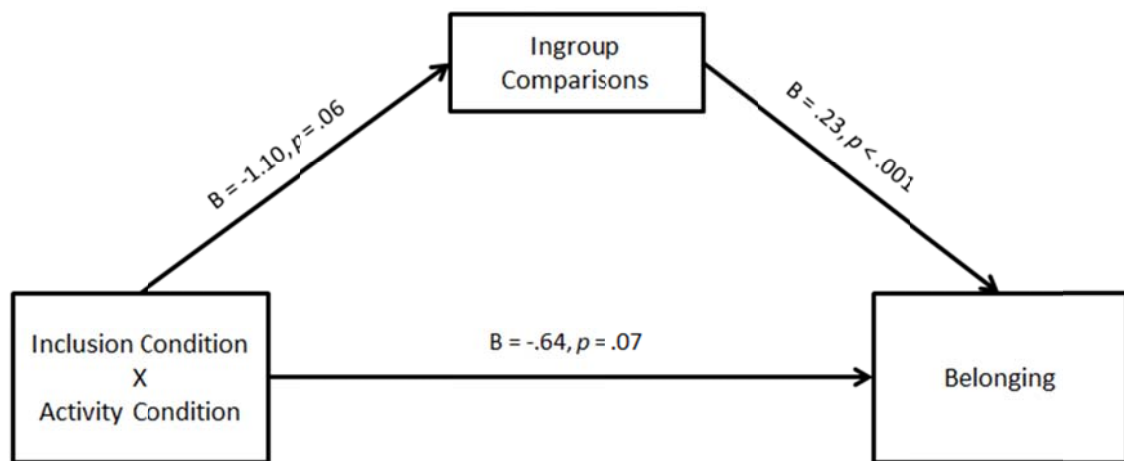


Figure 3. Study 4 Mediation analyses on belonging.

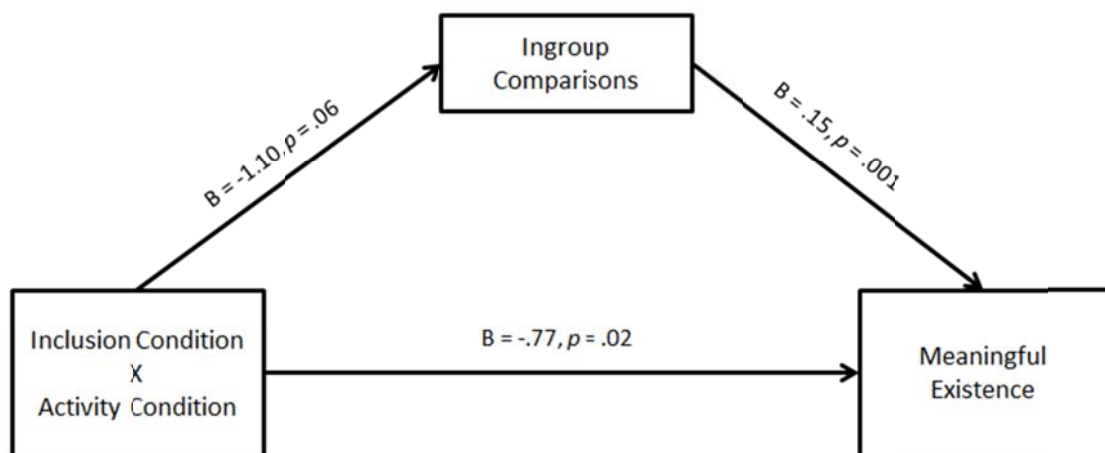


Figure 4. Study 4 Mediation analyses on meaningful existence.